

PERMITTEE: PARMA LAND DEVELOPMENT, LLC

PERMIT NUMBER: 2000-00621(0)

EFFECTIVE DATE: _____

NOTE: The term you and its derivatives, as used in this permit, means the permittee or any future transferee. The term "this office" refers to the appropriate district or division office of the Corps of Engineers having jurisdiction over the permitted activity under the authority of the commanding officer.

You are authorized to perform work in accordance with the terms and conditions specified below. (and continue on page 5)

PROJECT DESCRIPTION: PARMA LAND DEVELOPMENT, LLC, C/O HERITAGE DEVELOPMENT COMPANY, P.O. BOX 8022, 34555 CHAGRIN BOULEVARD, CHAGRIN FALLS, OHIO 44022, IS HEREBY AUTHORIZED BY THE SECRETARY OF THE ARMY TO: FILL APPROXIMATELY 3.37 ACRES OF WETLANDS AND IMPACT 0.2 ACRE OF WETLAND, AND FILL, CULVERT OR RELOCATE APPROXIMATELY 1,896 LINEAR FEET OF THREE UNNAMED TRIBUTARIES IN THE WEST CREEK WATERSHED, IN ACCORDANCE WITH THE GENERAL AND SPECIAL CONDITIONS, AND THE PLANS AND DRAWINGS AND ANY ADDITIONAL SPECIAL CONDITIONS ATTACHED HERETO WHICH ARE INCORPORATED IN AND MADE A PART OF THIS PERMIT.

PROJECT LOCATION: THE PROJECT IS LOCATED AT 7332-7422 BROADVIEW ROAD, IN THE CITY OF PARMA, CUYAHOGA COUNTY, OHIO.

PERMIT CONDITIONS

GENERAL CONDITIONS:

1. The time limit for completing the work authorized ends on _____. If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least one month before the above date is reached.
2. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you must make a good faith transfer to a third party in compliance with General Condition 4 below. Should you wish to cease to maintain the authorized activity, or should you desire to abandon it without a good faith transfer, you may obtain a modification of this permit from this office, which may require restoration of the area.
3. If you discover any previously unknown historic or archaeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and state coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.
4. If you sell the property associated with this permit, you must obtain the signature of the new owner in the space provided and forward a copy of the permit to this office to validate the transfer of this authorization.
5. If a conditioned water quality certification has been issued for your project, you must comply with the conditions specified in the certification as special conditions to this permit.
6. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of your permit.

FURTHER INFORMATION:

1. Congressional Authorities: You have been authorized to undertake the activity described above pursuant to:

Section 404 of the Clean Water Act (33 U.S.C. 1344).

2. Limits of this authorization.
 - a. This permit does not obviate the need to obtain other Federal, state or local authorizations required by law.
 - b. This permit does not grant any property rights or exclusive privileges.
 - c. This permit does not authorize any injury to the property or rights of others.
 - d. This permit does not authorize interference with any existing or proposed Federal project.
3. Limits of Federal Liability. In issuing this permit, the Federal Government does not assume any liability for the following:
 - a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.
 - b. Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the United States in the public interest.

c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.

d. Design or construction deficiencies associated with the permitted work.

e. Damage claims associated with any future modification, suspension, or revocation of this permit.

4. Reliance on Applicant's Data: The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.

5. Reevaluation of Permit Decision. This office may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a reevaluation include, but are not limited to, the following:

a. You fail to comply with the terms and conditions of this permit.

b. The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (see 4 above).

c. Significant new information surfaces which this office did not consider in reaching the original public interest decision.

Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 325.7 or enforcement procedures such as those contained in 33 CFR 326.4 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you to comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measures ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as this specified in 33 CFR 209.170) accomplish the corrective measures by contract or otherwise and bill you for the cost.

6. Extensions. General condition 1 establishes a time limit for the completion of the activity authorized by this permit. Unless there are circumstances requiring either a prompt completion of the authorized activity or a reevaluation of the public interest decision, the Corps will normally give favorable consideration to a request for an extension of this time limit.

Your signature below, as permittee, indicates that you accept and agree to comply with the terms and conditions of this permit.

(PERMITTEE)

(DATE)

This permit becomes effective when the Federal official, designated to act for the Secretary of the Army, has signed below.

(DISTRICT COMMANDER)

(DATE)

When the structures or work authorized by this permit are still in existence at the time the property is transferred, the terms and conditions of this permit will continue to be binding on the new owner(s) of the property. To validate the transfer of this permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.

(TRANSFEREE)

(DATE)

SPECIAL CONDITIONS:

1. That you are responsible for ensuring that the contractor and/or workers executing the activity(s) authorized by this permit have knowledge of the terms and conditions of the authorization and that a copy of the permit document is at the project site throughout the period the work is underway.
2. That at the request of an authorized representative of the Buffalo District, U.S. Army Corps of Engineers, you shall allow access to the project site and the mitigation parcel to determine compliance with the conditions of this permit.
3. That trees with cavities or exfoliated bark shall not be cut between April 15 and September 15 without first conducting a mist survey (or other acceptable survey) for the Indiana bat (*Myotis sodalis*). Trees with cavities or exfoliating bark may provide potential roosting habitat for this Federally listed endangered species. Additional information may be obtained by contacting Mr. Buddy Fazio of the U.S. Fish and Wildlife Service at (614) 469-6923.
4. Turbidity controls in the form of silt curtains or similar type cloth material shall be installed downstream from the project area and shall remain in place during all excavation and restoration operations.
5. That the fill created by the discharge shall be properly maintained to prevent erosion and other non-point sources of pollution.
6. All erosion and sediment control practices shall be in place prior to any grading or filling operations and installation of proposed structures or utilities. They shall remain in place until construction is completed and the area is stabilized.
7. That the fill material shall be free of oil and grease, debris, wood, general refuse, plaster and other pollutants, and shall contain no broken asphalt.
8. Sufficient flow of water shall be maintained at all times to sustain aquatic life downstream.
9. That the Water Quality Certification issued for this project by the State of Ohio is part of this Department of the Army permit pursuant to Section 401(d) of the Clean Water Act. Noncompliance with any limitations or requirements stated in the certification may be a basis for suspension, revocation or modification of this permit.

SPECIAL CONDITIONS CONTINUED:

10. That as mitigation for the proposed impacts, you will perform the following mitigation:

On-Site:

a) the enhancement of approximately 1039 linear feet of West Creek by cleaning up debris and adding boulders, glides, undercut banks and overhanging vegetation, aquatic macrophytes, cobbles, and woody debris. A conservation easement will be placed on approximately 766 linear feet of this project.

b) the relocation of the upstream portion of stream A to an approximately 829 linear foot channel, including transfer of cobbles and gravel from the original stream bed and the use of step pools and bioengineering techniques to create habitat and shading.

c) the relocation of approximately 641 linear feet of the lower end of Stream B to travel through Wetland B before entering West Creek. The completed on-site length of the restored stream will be 911 linear feet.

d) the creation of a 0.39 acre wet detention basin system utilizing an undulating bottom, wetland vegetation plantings, and a maintenance forebay area.

e) the installation of a flow control device at the mouth of the box culvert which channels water that enters the site under Broadview Road, to pipe normal flows to Stream A. Flows above that quantity will be directed to the above mentioned wet detention system.

f) the preservation of 0.82 acre of wetland (Wetland B) and the creation of a 0.22 acre extension of this wetland.

g) the donation of approximately 9 acres of the site, including the original portion of Wetland B and 400 linear feet of West Creek to the City of Parma for use as public parkland.

h) the enhancement of 0.07 acre of wetlands (Wetlands C and D) located on an additional parcel of land which has since been added to the proposed project, and the creation of 0.93 acre of wetlands located north of Stream A.

i) the placement of a conservation easement on the on-site portions of West Creek, the Wetland B extension, and the wetland complex associated with and including Wetlands C and D.

Off-Site:

j) the funding of approximately 3.0 acres of wetland restoration at the Mantua Center Wetland Restoration Site, located in Mantua Township, Portage County, Ohio.

SPECIAL CONDITIONS CONTINUED:

k) the preservation of approximately 7.75 acres of wetlands at the Twinsburg Bog within an 87 acre parcel located west of Ravenna Road, in the Town of Twinsburg, Summit County, Ohio. The conservation easement on this preservation acreage will be held by the Tinker's Creek Land Conservancy. A copy of this executed agreement will be submitted to this office ATTN: Elizabeth

Stone, prior to any wetland or stream impacts on-site.

11. Wetland and stream mitigation construction shall begin prior to or simultaneously with before the construction activities in wetlands and streams authorized by this permit. Stream restoration and enhancement and wetland creation and enhancement activities shall be completed within one year of commencement.

12. That the following reports shall be attached to and made a part of this permit: "Conceptual Stream Relocation Plan for Relocated Stream A" and "Conceptual Stream Restoration Plan for Relocated Stream B".

13. That the document titled "Parma Land Development LLC 401 Water Quality Certification and Attachments, May 11, 2001", a preliminary document from the Attorney General's office and developed through negotiations with the Ohio Environmental Protection Agency, is hereby attached to and made a part of this permit. All agreements, stipulations, schedules, monitoring programs, and conditions included therein shall be in effect. In addition, the following criteria shall be added:

a) That at the end of the fifth year post construction of the on-site wetland mitigation, the mitigation wetlands shall be vegetated with a minimum of 80% areal cover of hydrophytic vegetation, excluding *Myriophyllum spicatum*. In addition, less than 5% areal cover of the mitigation area shall be vegetated with the following invasive species: *Lythrum salicaria*, *Phragmites spp.*, *Phalaris arundinacea*, *Solanum dulcamera*, *Rhamnus frangula*, *Typha angustifolia*, and *Typha x glauca*. In the event that these criteria are not met, the applicant shall undertake remedial actions identified by the District Commander. These actions may include, but are not limited to, correction actions on-site or an alternative wetland mitigation plan to implemented on the same or an alternate site.

b) The following species shall be excluded from all project planting and landscaping within 100 feet of all mitigation areas:

- Herbs
- Glyceria maxima*
- Lythrum salicaria*
- Phalaris arundinacea*
- Phragmites spp.*
- Polygonum cuspidatum*
- Typha latifolia*, *T. angustifolia*, *T. x glauca*

SPECIAL CONDITIONS CONTINUED:

- Woody Plants
- Elaeagnus angustifolia*
- Lonicera tatarica*, *L. morrowii*, *L. xylosteum*
- Rhamnus cathartica*, *R. frangula*
- Rosa multiflora*
- Solanum dulcamera*

c) That corrective measures shall be implemented to preclude the growth of the following invasive species should they appear within the wetland mitigation areas: *Phalaris arundinacea*, *Phragmites australis*, *Solanum dulcamera*, *Rhamnus spp.*, *Rosa multiflora*, *Polygonum cuspidatum*, *Lythrum salicaria*, and *Typha angustifolia* and *Typha x glauca*.

d) Copies of all monitoring reports will be forwarded to the Corps of Engineers by January 31 following each of the three monitoring years.

14. That all conditions for the Stream A relocation identified in the document cited in Special Condition 12 will apply to the proposed Stream B relocation, except that post development Stream B will achieve a minimum Qualitative Habitat Evaluation Index Score of 50.5.

15. That the document titled "Preliminary Wetlands Walkover and Species Resource Assessment, 87 Acre (Approximate) Property Located West of Ravenna Road, Twinsburg, Summit County, Ohio" dated September 2000 and the map depicting the proposed wetland mitigation preservation area at this location received on June 13, 2001, is hereby incorporated into and made a part of this permit.

16. That a copy of the executed conservation easement for the 9-acre donation and on-site portions of the West Creek corridor will be submitted to this office ATTN: Elizabeth Stone, prior to any impacts to wetlands or streams on-site.

17. That prior to the discharge of any additional dredged or fill material into wetlands as authorized by this permit, you shall install and maintain erosion and sedimentation controls in and/or adjacent to wetlands or other waters of the United States which are not immediately scheduled to be filled and/or authorized to be filled. Plans for erosion and sedimentation controls in and/or adjacent to wetlands or other waters of the United States shall be contained in a project specific Storm Water Pollution Prevention Plan (SWP3) that has been approved by the Ohio Environmental Protection Agency. The SWP3 and request for approval of the erosion and sedimentation controls in and/or adjacent to wetlands or other waters of the United States shall be submitted to Mr. Dan Bogoevski of the Ohio Environmental Protection Agency, Northeast District Office, 2110 E. Aurora Road, Twinsburg, Ohio 44087.

Mr. Bogoevski can also be reached by called 330-963-1145. A copy of the approved SWP3 shall be submitted to this office ATTN: Ms. Elizabeth W. Stone prior to commencement of the discharge.

**NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND
REQUEST FOR APPEAL**

Applicant: Parma Land Development, LLC		File Number: 2000-00621(0)	Date: 9/18/01
Attached is:		See Section below	
X	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)	A	
	PROFFERED PERMIT (Standard Permit or Letter of permission)	B	
	PERMIT DENIAL	C	
	APPROVED JURISDICTIONAL DETERMINATION	D	
	PRELIMINARY JURISDICTIONAL DETERMINATION	E	

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at <http://usace.army.mil/inet/functions/cw/cecwo/reg> or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- **ACCEPT:** If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- **OBJECT:** If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- **ACCEPT:** If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- **APPEAL:** If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- **ACCEPT:** You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- **APPEAL:** If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision and/or the appeal process you may contact:

Elizabeth W. Stone
U.S. Army Corps of Engineers
1776 Niagara Street
Buffalo, New York 14207-3199
(716) 879-4363
Elizabeth.W.Stone@usace.army.mil

If you only have questions regarding the appeal process you may also contact:

Ms. Suzanne Chubb
U.S. Army Corps of Engineers
Great Lakes and Ohio River Division
550 Main Street
Cincinnati, OH 45201-1159
(513) 684-7261
suzanne.l.chubb@lrdor.usace.army.mil

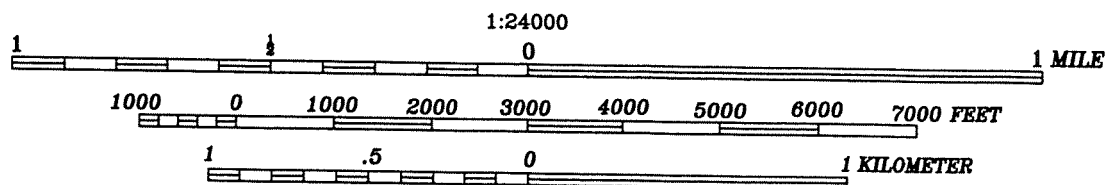
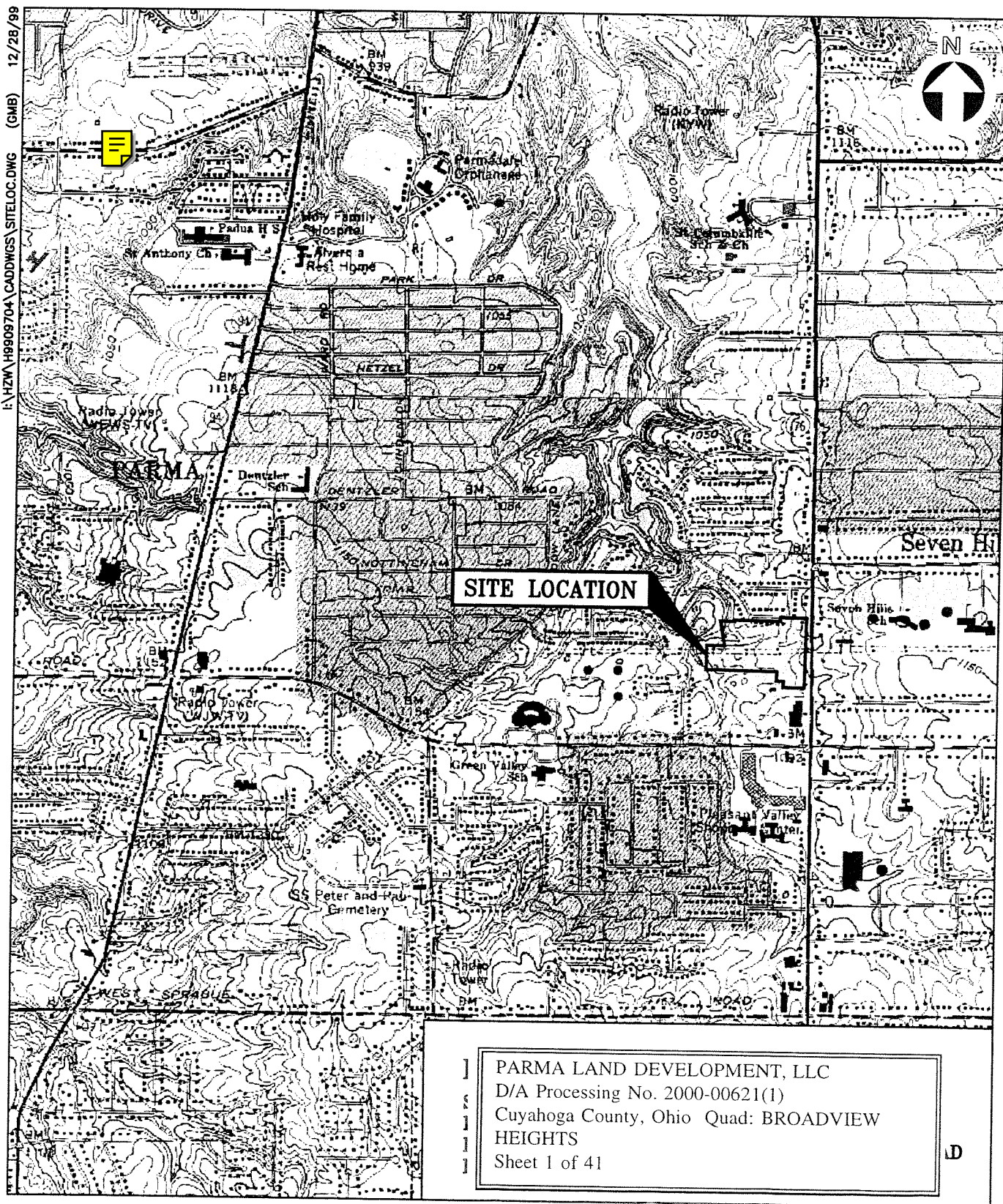
RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

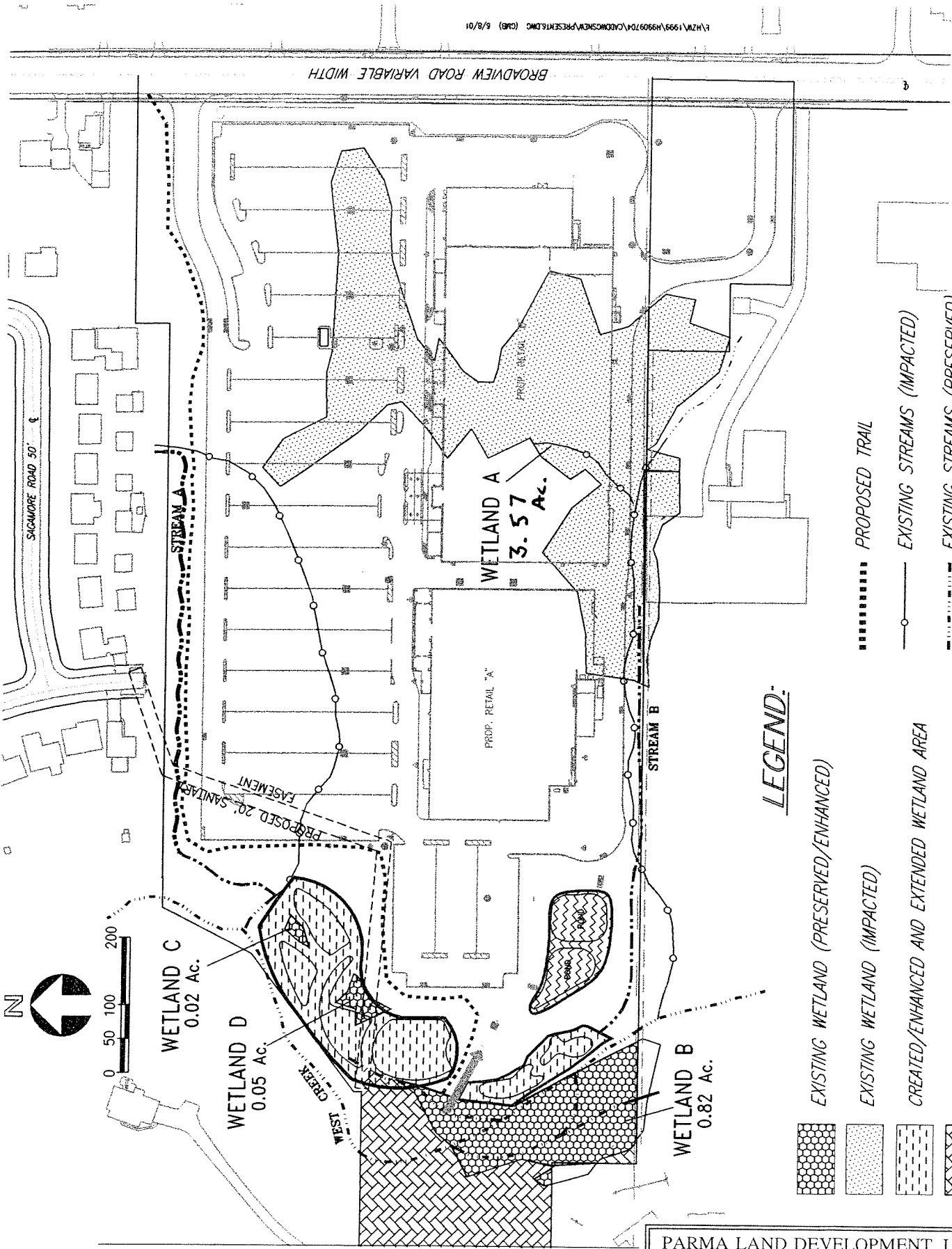
Signature of appellant or agent.

Date:

Telephone number:

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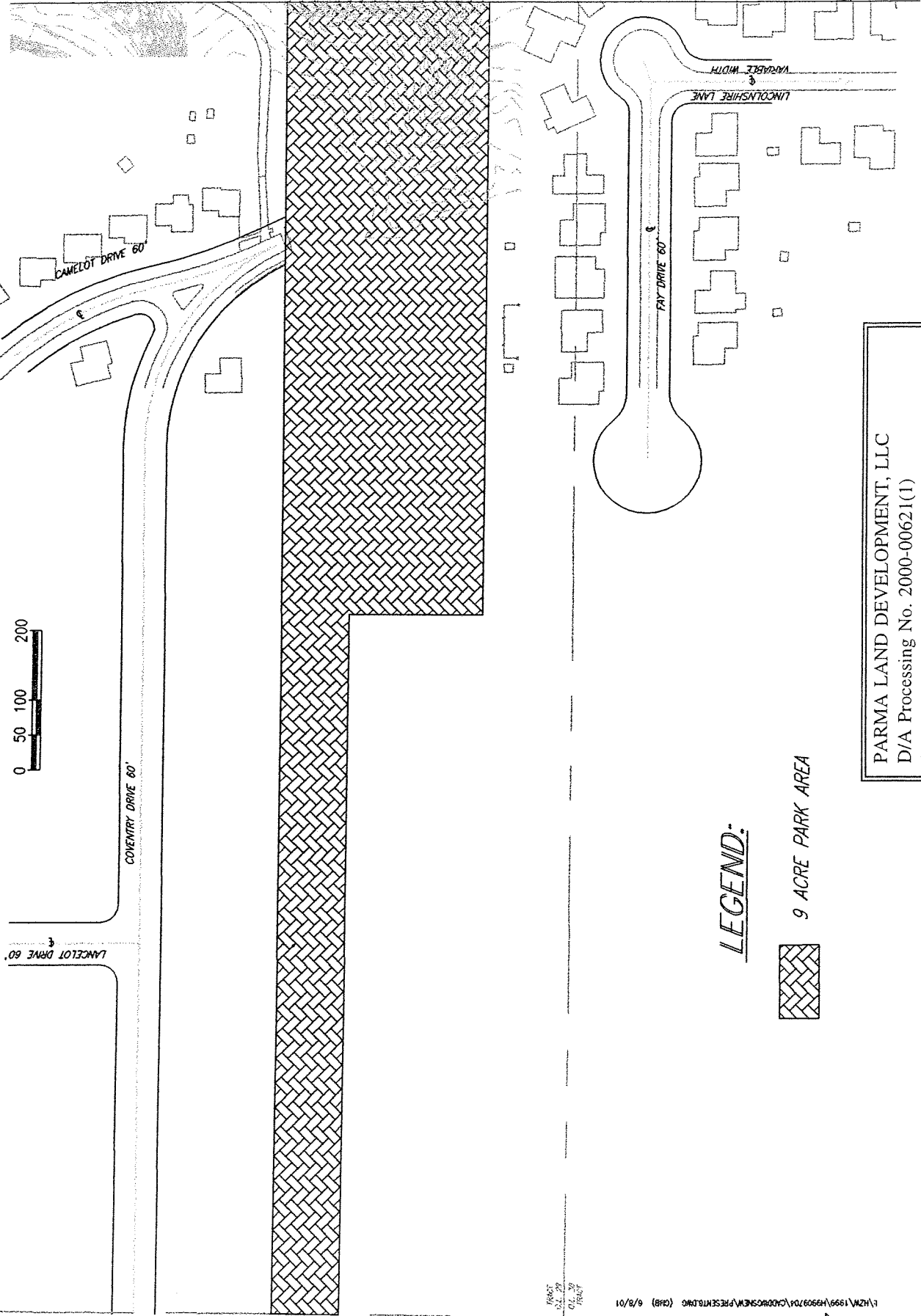
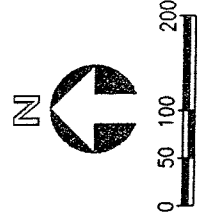
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LEGEND:

- EXISTING WETLAND (PRESERVED/ENHANCED)
- EXISTING WETLAND (IMPACTED)
- CREATED/ENHANCED AND EXTENDED WETLAND AREA
- 9 ACRE PARK AREA
- RETENTION POND WITH WETLAND CHARACTERISTICS

- PROPOSED TRAIL
- EXISTING STREAMS (IMPACTED)
- EXISTING STREAMS (PRESERVED)
- RELOCATED STREAMS
- PROPOSED SANITARY EASEMENT

MATCH LINE



LEGEND:



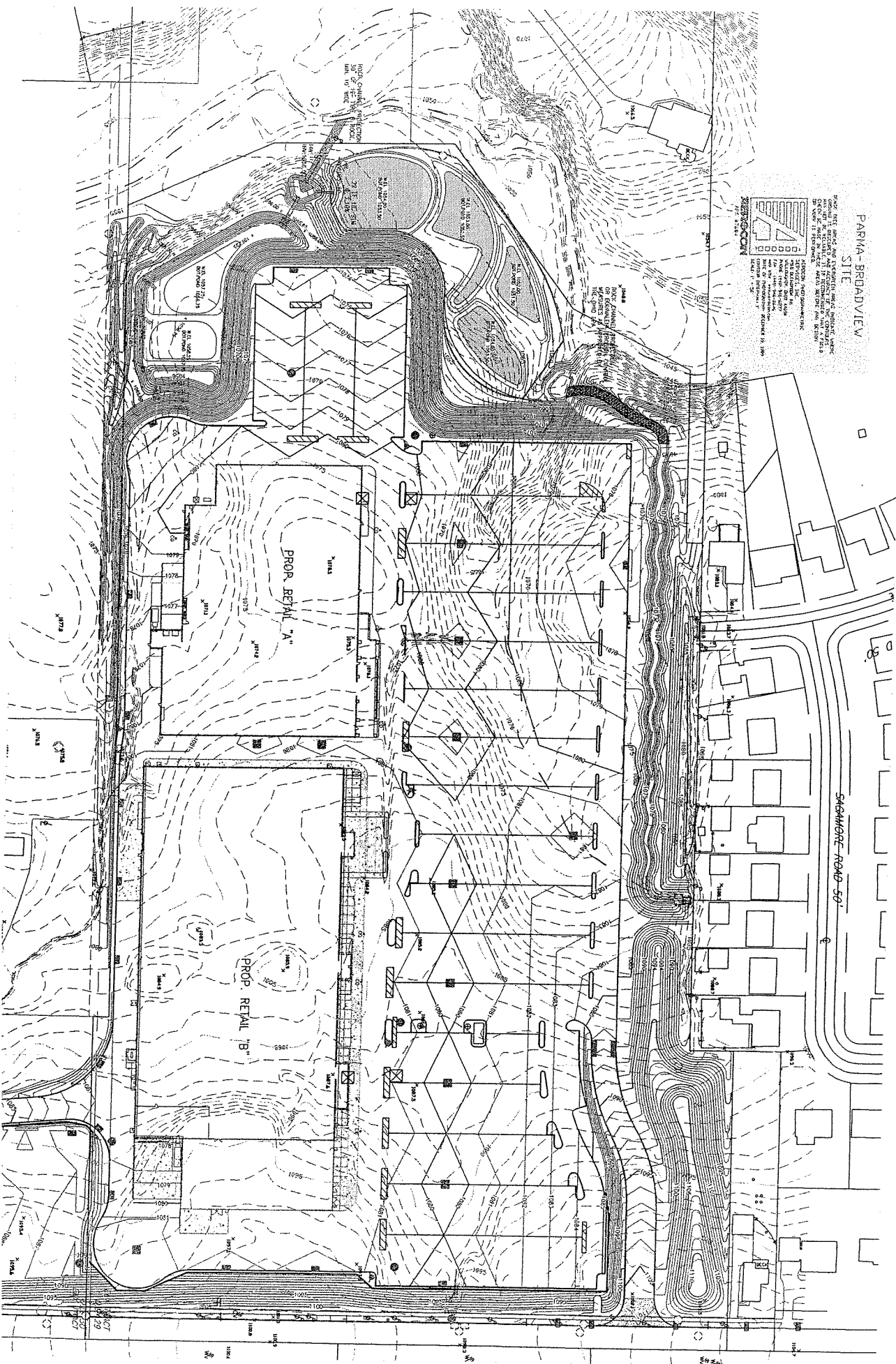
9 ACRE PARK AREA

PARMA LAND DEVELOPMENT, LLC
D/A Processing No. 2000-00621(1)
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HEIGHTS
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Project
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01.29
Final

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PARMA LAND DEVELOPMENT, LLC
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Cuyahoga County, Ohio Quad: BROADVIEW
HEIGHTS
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PROPOSED SITE PLAN
2 OF 3

PARMA-BROADVIEW
SITE

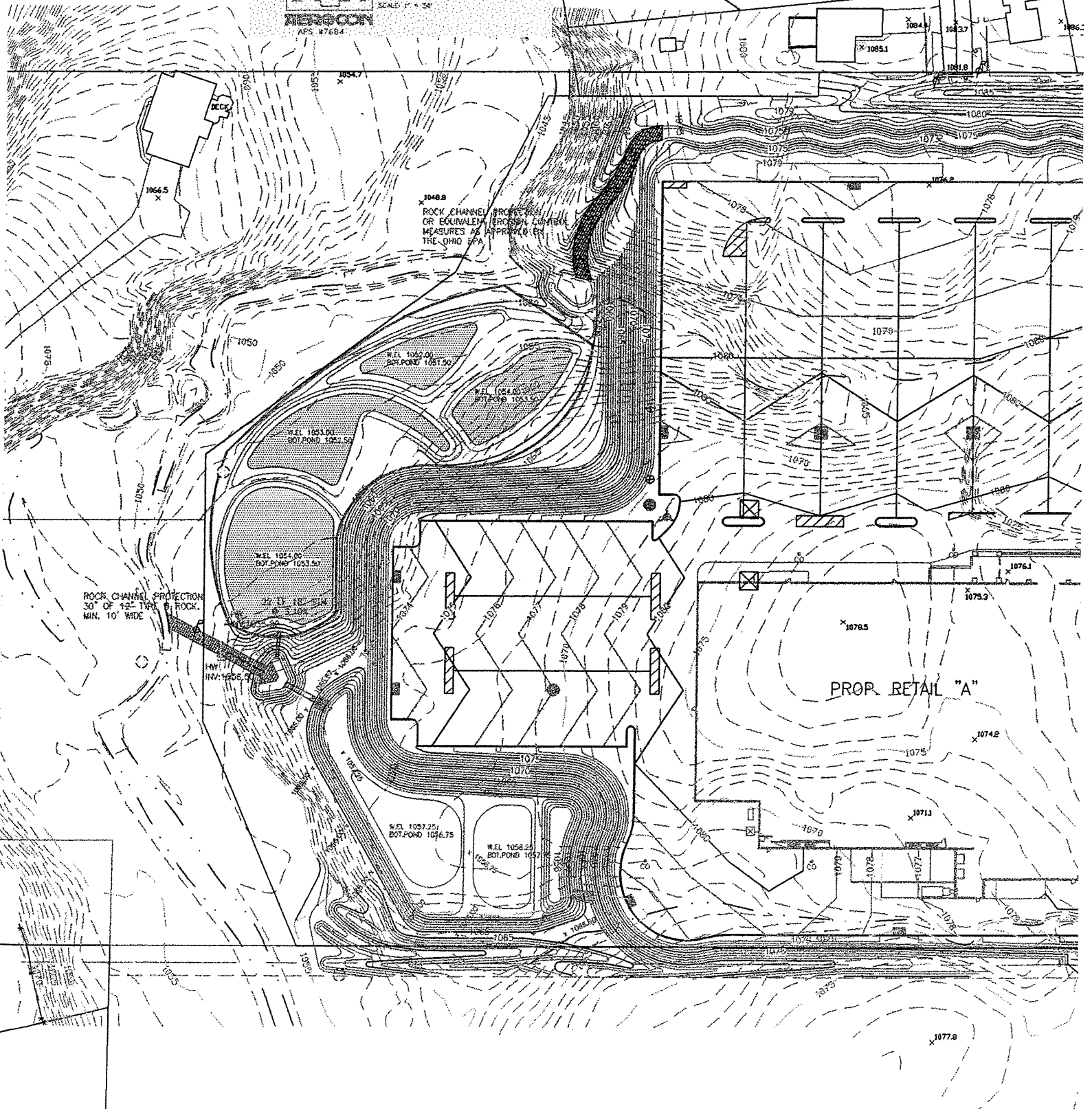
ENDS TREE AREAS AND EVERGREEN AREAS INDICATE WHERE
GROUND IS DISCLOSED AND ACCURACY OF THE CONTROLS
MAY NOT BE RELIABLE. IT IS RECOMMENDED THAT A FIELD
CHECK BE MADE IN THESE AREAS BEFORE ANY DESIGN
OR WORK IS PERFORMED.



AEROCON PHOTOGRAMMETRIC
SERVICES, INC.
4515 GLENNVIEW RD.
VILLAGE GROVE, OHIO 44094
PHONE (440) 946-6277
FAX (440) 946-2544
WEB SITE: www.aericon.com
DATE OF PHOTOGRAPHY: DECEMBER 19, 1999
CENTER INTERVAL: 1"
SCALE: 1" = 50'

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APS #7664

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HEIGHTS
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PROPOSED SITE PLAN
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SAGAMORE ROAD 50'

PROP. RETAIL "B"

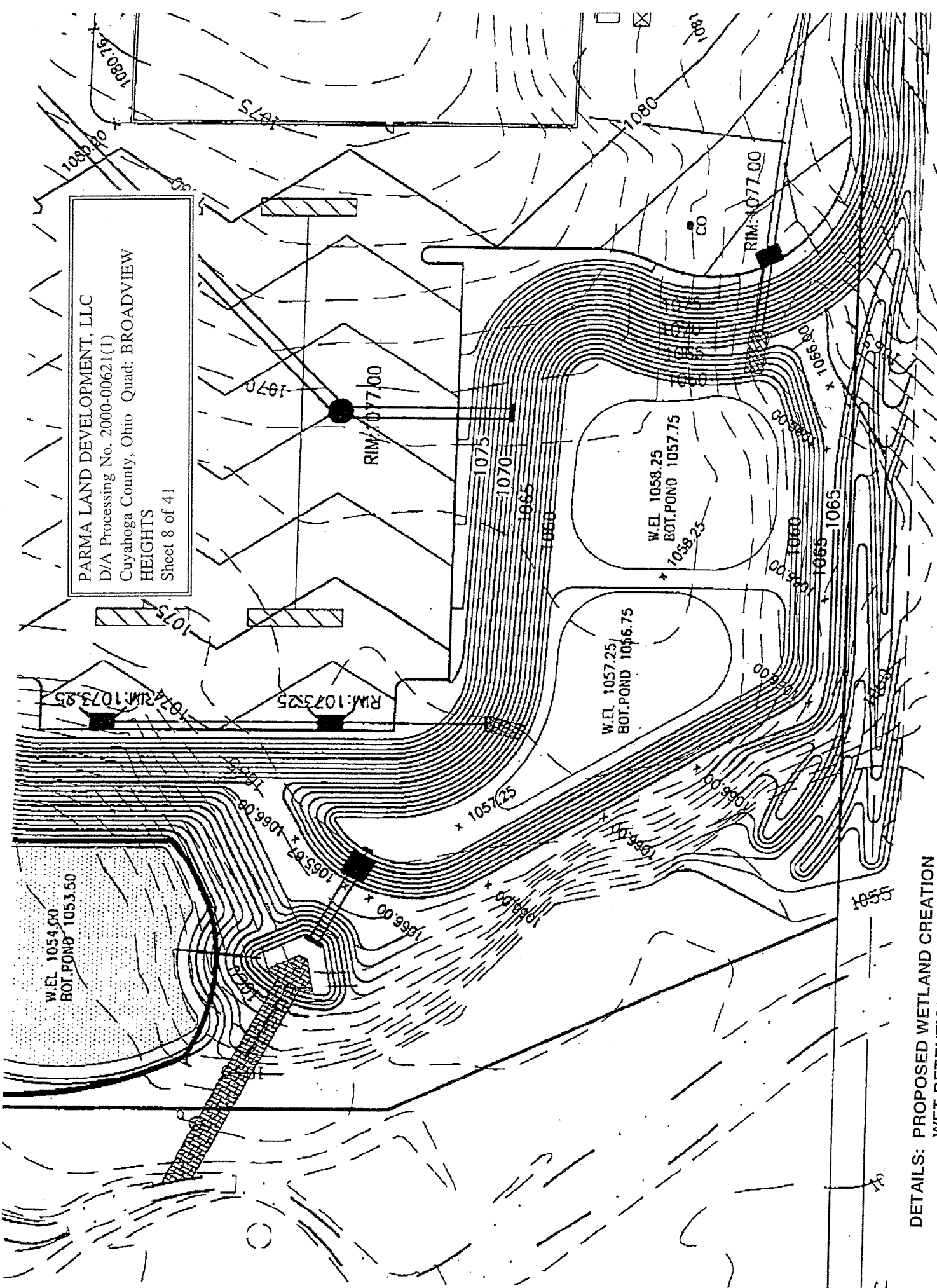
PARMA LAND DEVELOPMENT, LLC
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PARMA LAND DEVELOPMENT, LLC
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The map displays a proposed wetland area with several ponds. Key features include:

- Wetland Ponds:**
 - W.E.L. 1052.00 BOT. POND 1051.50
 - W.E.L. 1054.00 BOT. POND 1053.50
 - W.E.L. 1053.00 BOT. POND 1052.50
 - W.E.L. 1054.00 BOT. POND 1053.50
 - W.E.L. 1057.25 BOT. POND 1056.75
 - W.E.L. 1058.25 BOT. POND 1057.75
- Contours and Elevation:** Contour lines are shown at 1-foot intervals, with major contours labeled every 5 feet (e.g., 1050, 1055, 1060, 1065, 1070, 1075, 1080, 1085, 1090, 1095, 1100, 1105, 1110, 1115, 1120, 1125, 1130, 1135, 1140, 1145, 1150, 1155, 1160, 1165, 1170, 1175, 1180, 1185, 1190, 1195, 1200, 1205, 1210, 1215, 1220, 1225, 1230, 1235, 1240, 1245, 1250, 1255, 1260, 1265, 1270, 1275, 1280, 1285, 1290, 1295, 1300, 1305, 1310, 1315, 1320, 1325, 1330, 1335, 1340, 1345, 1350, 1355, 1360, 1365, 1370, 1375, 1380, 1385, 1390, 1395, 1400, 1405, 1410, 1415, 1420, 1425, 1430, 1435, 1440, 1445, 1450, 1455, 1460, 1465, 1470, 1475, 1480, 1485, 1490, 1495, 1500, 1505, 1510, 1515, 1520, 1525, 1530, 1535, 1540, 1545, 1550, 1555, 1560, 1565, 1570, 1575, 1580, 1585, 1590, 1595, 1600, 1605, 1610, 1615, 1620, 1625, 1630, 1635, 1640, 1645, 1650, 1655, 1660, 1665, 1670, 1675, 1680, 1685, 1690, 1695, 1700, 1705, 1710, 1715, 1720, 1725, 1730, 1735, 1740, 1745, 1750, 1755, 1760, 1765, 1770, 1775, 1780, 1785, 1790, 1795, 1800, 1805, 1810, 1815, 1820, 1825, 1830, 1835, 1840, 1845, 1850, 1855, 1860, 1865, 1870, 1875, 1880, 1885, 1890, 1895, 1900, 1905, 1910, 1915, 1920, 1925, 1930, 1935, 1940, 1945, 1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015, 2020, 2025, 2030, 2035, 2040, 2045, 2050, 2055, 2060, 2065, 2070, 2075, 2080, 2085, 2090, 2095, 2100, 2105, 2110, 2115, 2120, 2125, 2130, 2135, 2140, 2145, 2150, 2155, 2160, 2165, 2170, 2175, 2180, 2185, 2190, 2195, 2200, 2205, 2210, 2215, 2220, 2225, 2230, 2235, 2240, 2245, 2250, 2255, 2260, 2265, 2270, 2275, 2280, 2285, 2290, 2295, 2300, 2305, 2310, 2315, 2320, 2325, 2330, 2335, 2340, 2345, 2350, 2355, 2360, 2365, 2370, 2375, 2380, 2385, 2390, 2395, 2400, 2405, 2410, 2415, 2420, 2425, 2430, 2435, 2440, 2445, 2450, 2455, 2460, 2465, 2470, 2475, 2480, 2485, 2490, 2495, 2500, 2505, 2510, 2515, 2520, 2525, 2530, 2535, 2540, 2545, 2550, 2555, 2560, 2565, 2570, 2575, 2580, 2585, 2590, 2595, 2600, 2605, 2610, 2615, 2620, 2625, 2630, 2635, 2640, 2645, 2650, 2655, 2660, 2665, 2670, 2675, 2680, 2685, 2690, 2695, 2700, 2705, 2710, 2715, 2720, 2725, 2730, 2735, 2740, 2745, 2750, 2755, 2760, 2765, 2770, 2775, 2780, 2785, 2790, 2795, 2800, 2805, 2810, 2815, 2820, 2825, 2830, 2835, 2840, 2845, 2850, 2855, 2860, 2865, 2870, 2875, 2880, 2885, 2890, 2895, 2900, 2905, 2910, 2915, 2920, 2925, 2930, 2935, 2940, 2945, 2950, 2955, 2960, 2965, 2970, 2975, 2980, 2985, 2990, 2995, 3000, 3005, 3010, 3015, 3020, 3025, 3030, 3035, 3040, 3045, 3050, 3055, 3060, 3065, 3070, 3075, 3080, 3085, 3090, 3095, 3100, 3105, 3110, 3115, 3120, 3125, 3130, 3135, 3140, 3145, 3150, 3155, 3160, 3165, 3170, 3175, 3180, 3185, 3190, 3195, 3200, 3205, 3210, 3215, 3220, 3225, 3230, 3235, 3240, 3245, 3250, 3255, 3260, 3265, 3270, 3275, 3280, 3285, 3290, 3295, 3300, 3305, 3310, 3315, 3320, 3325, 3330, 3335, 3340, 3345, 3350, 3355, 3360, 3365, 3370, 3375, 3380, 3385, 3390, 3395, 3400, 3405, 3410, 3415, 3420, 3425, 3430, 3435, 3440, 3445, 3450, 3455, 3460, 3465, 3470, 3475, 3480, 3485, 3490, 3495, 3500, 3505, 3510, 3515, 3520, 3525, 3530, 3535, 3540, 3545, 3550, 3555, 3560, 3565, 3570, 3575, 3580, 3585, 3590, 3595, 3600, 3605, 3610, 3615, 3620, 3625, 3630, 3635, 3640, 3645, 3650, 3655, 3660, 3665, 3670, 3675, 3680, 3685, 3690, 3695, 3700, 3705, 3710, 3715, 3720, 3725, 3730, 3735, 3740, 3745, 3750, 3755, 3760, 3765, 3770, 3775, 3780, 3785, 3790, 3795, 3800, 3805, 3810, 3815, 3820, 3825, 3830, 3835, 3840, 3845, 3850, 3855, 3860, 3865, 3870, 3875, 3880, 3885, 3890, 3895, 3900, 3905, 3910, 3915, 3920, 3925, 3930, 3935, 3940, 3945, 3950, 3955, 3960, 3965, 3970, 3975, 3980, 3985, 3990, 3995, 4000, 4005, 4010, 4015, 4020, 4025, 4030, 4035, 4040, 4045, 4050, 4055, 4060, 4065, 4070, 4075, 4080, 4085, 4090, 4095, 4100, 4105, 4110, 4115, 4120, 4125, 4130, 4135, 4140, 4145, 4150, 4155

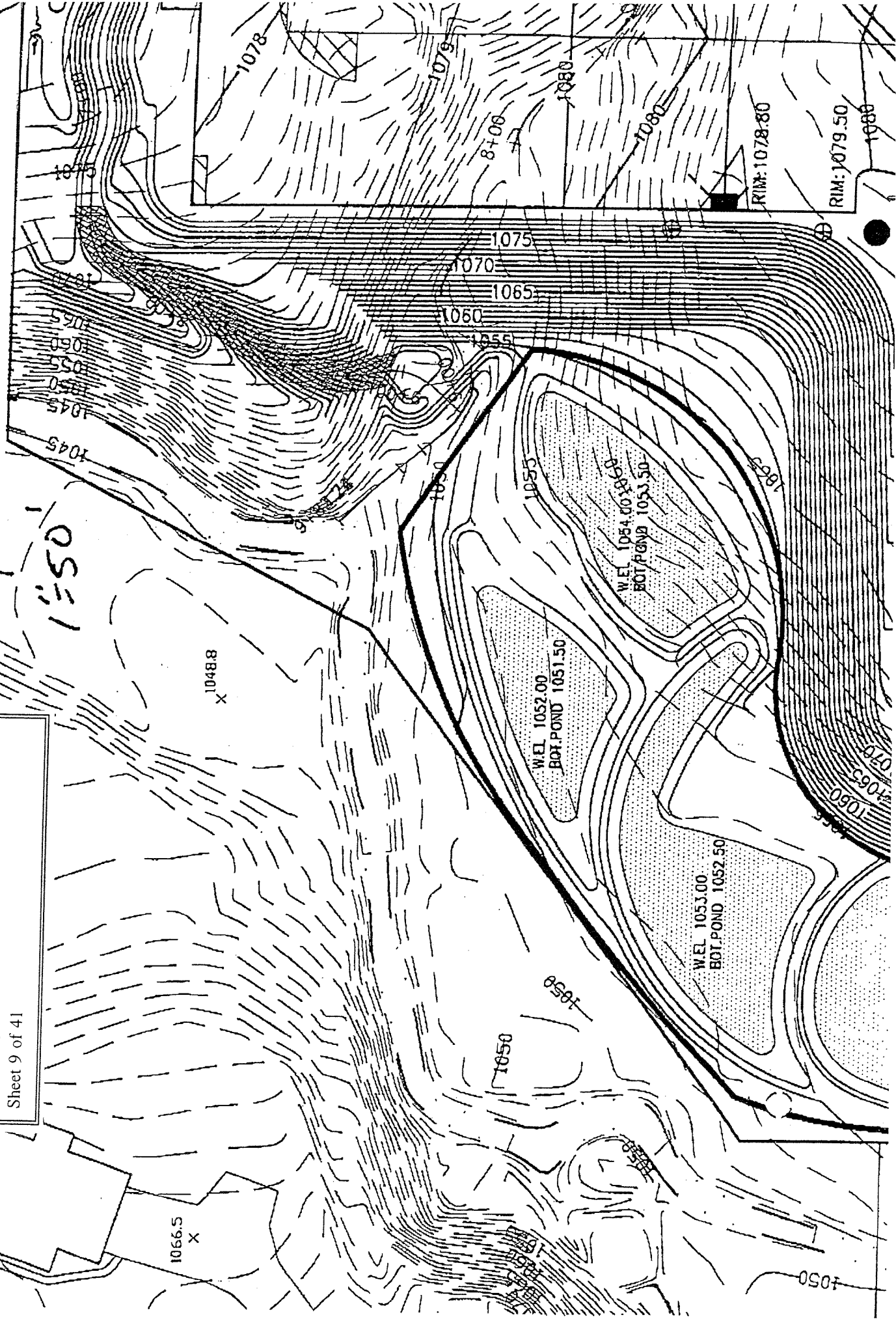
See sheet 10 of 41
for forebay

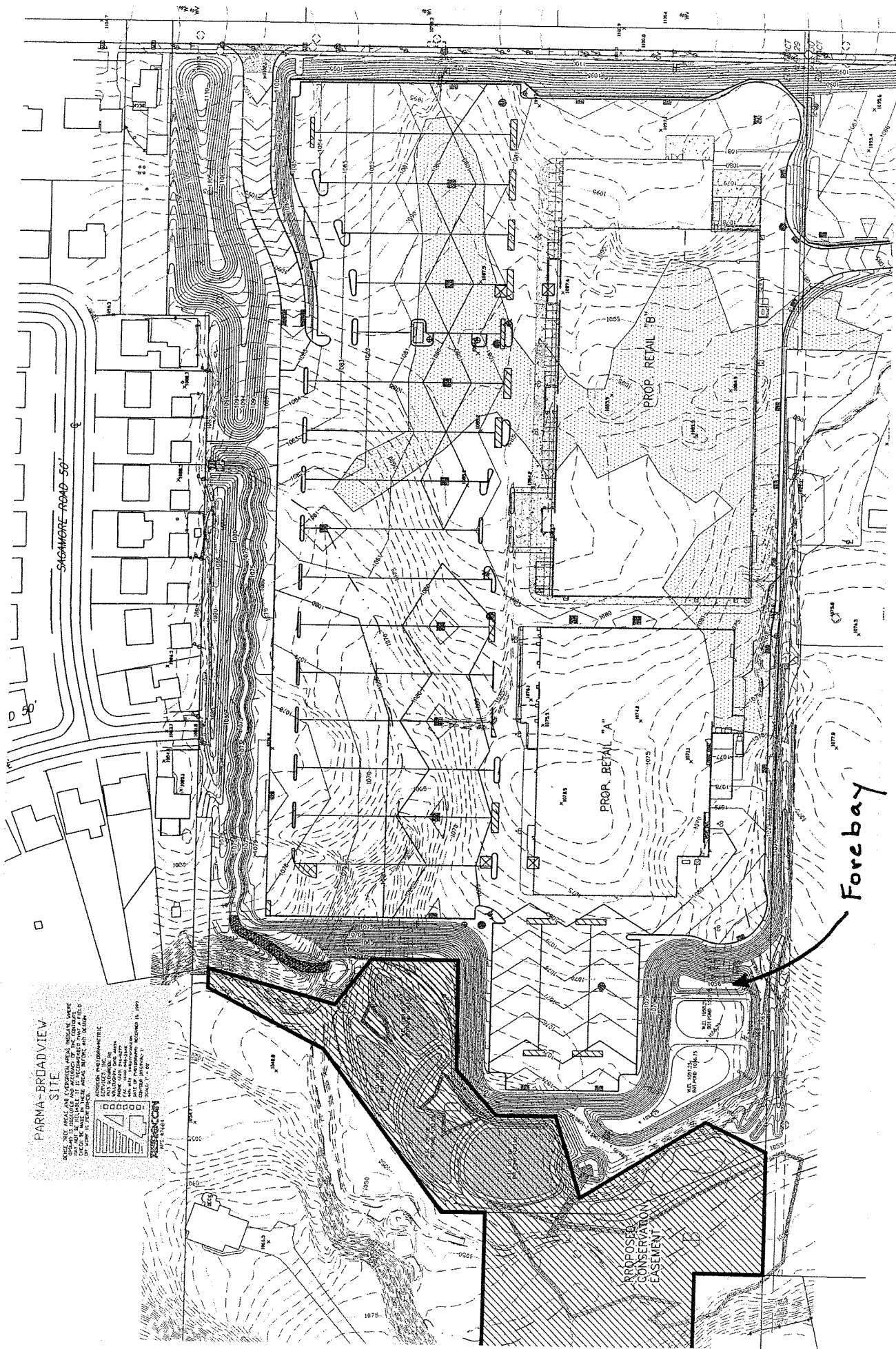


DETAILS: PROPOSED WETLAND CREATION
WET DETENTION BASIN SYSTEM
2 OF 3

PARMA LAND DEVELOPMENT, LLC
D/A Processing No. 2000-00621(1)
Cuyahoga County, Ohio Quad: BROADVIEW
HEIGHTS
Sheet 9 of 41

DETAILS: PROPOSED WETLAND CREATION
WET DETENTION BASIN SYSTEM
3 OF 3





PROPOSED CONSERVATION EASEMENT
1 OF 3

PARMA LAND DEVELOPMENT, LLC
D/A Processing No. 2000-00621(1)
Cuyahoga County, Ohio Quad: BROADVIEW
HEIGHTS
Sheet 10 of 41

PARMA-BROADVIEW
SITE

DENSE TREE AREAS AND EVERGREEN AREAS INDICATE WHERE
GROUND IS OBSURED AND ACCURACY OF THE CONTOURS
MAY NOT BE RELIABLE. IT IS RECOMMENDED THAT A FIELD
CHECK BE MADE IN THESE AREAS BEFORE ANY DESIGN
OR WORK IS PERFORMED.



AERICON PHOTOGRAMMETRIC
SERVICES, INC.
4015 GLENVIEW RD
WILMINGTON, OHIO 44094
PHONE (440) 246-2677
FAX (440) 246-2646
TEL. EIS: WWSOFF@AERICON
DATE OF PHOTOGRAPHY: DECEMBER 28, 1999
CONTINUITY INTERVAL: 1
SCALE: 1" = 50'

TELECON
AFS #7684

PROPOSED
CONSERVATION
EASEMENT

PROP RETAIL "A"

PARMA LAND DEVELOPMENT, LLC
D/A Processing No. 2000-00621(1)
Cuyahoga County, Ohio Quad: BROADVIEW
HEIGHTS
Sheet 11 of 41

PROPOSED CONSERVATION EASEMENT
3 OF 3

SAGAMORE ROAD 50'

PARMA LAND DEVELOPMENT, LLC
D/A Processing No. 2000-00621(1)
Cuyahoga County, Ohio Quad: BROADVIEW
HEIGHTS
Sheet 12 of 41

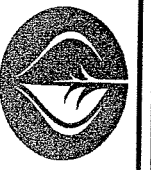


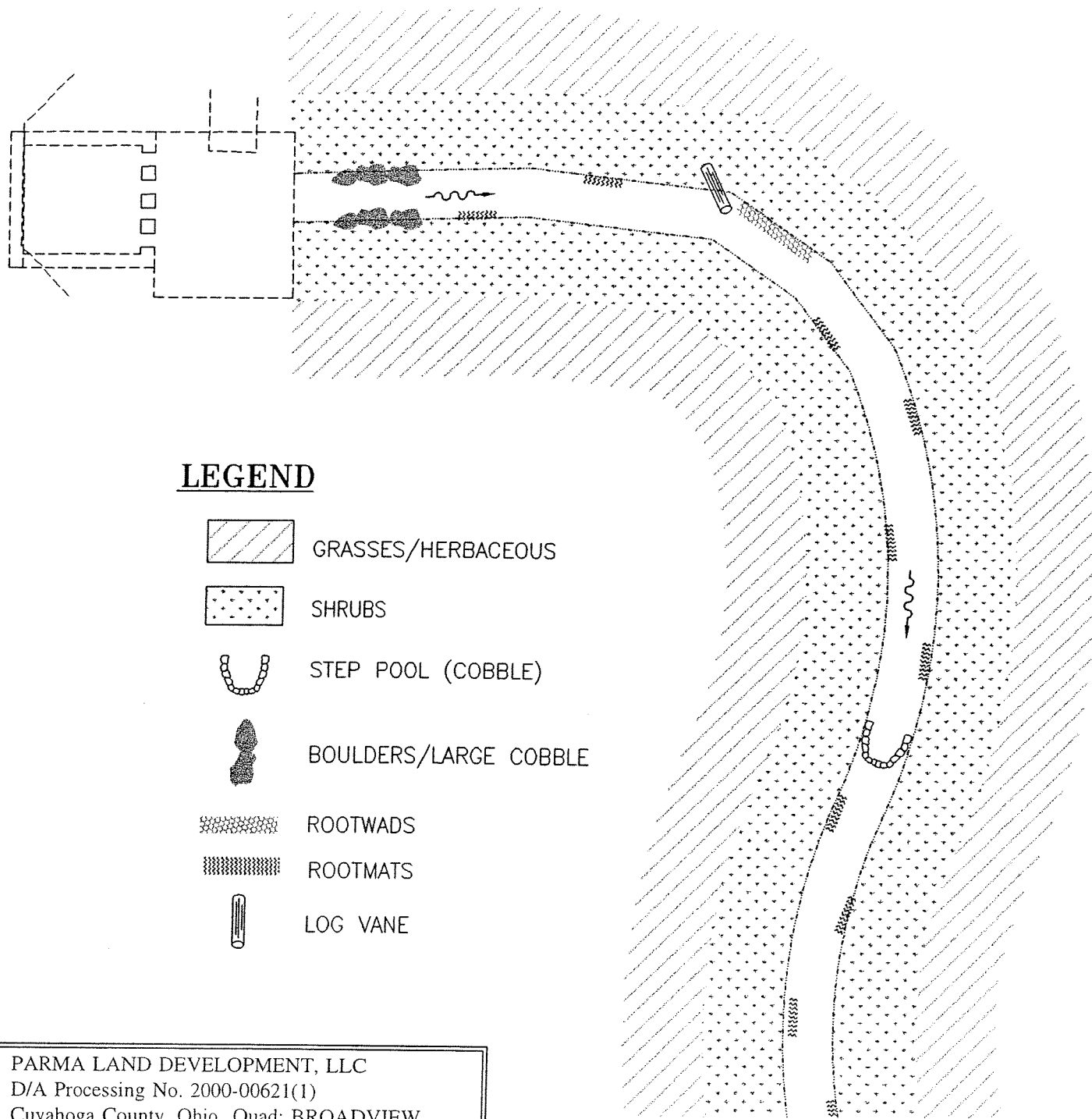
PARMA LAND DEVELOPMENT, LLC
 D/A Processing No. 2000-00621(1)
 Cuyahoga County, Ohio Quad: BROADVIEW
 HEIGHTS
 Sheet 13 of 41



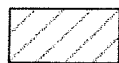
SITE PLAN SHOWING THE LOCATION OF
 RELOCATED AND EXISTING STREAM A
 BROADVIEW ROAD COMMERCIAL SITE
 PARMA LAND DEVELOPMENT LLC
 PARMA, CUYAHOGA COUNTY, OHIO

Hzw ENVIRONMENTAL
 CONSULTANTS, INC.
 6105 Heisley Rd. ■ Mentor, OH 44060
 440-357-1260 ■ Fax 440-357-1510

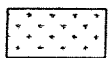




LEGEND



GRASSES/HERBACEOUS



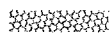
SHRUBS



STEP POOL (COBBLE)



BOULDERS/LARGE COBBLE



ROOTWADS



ROOTMATS



LOG VANE

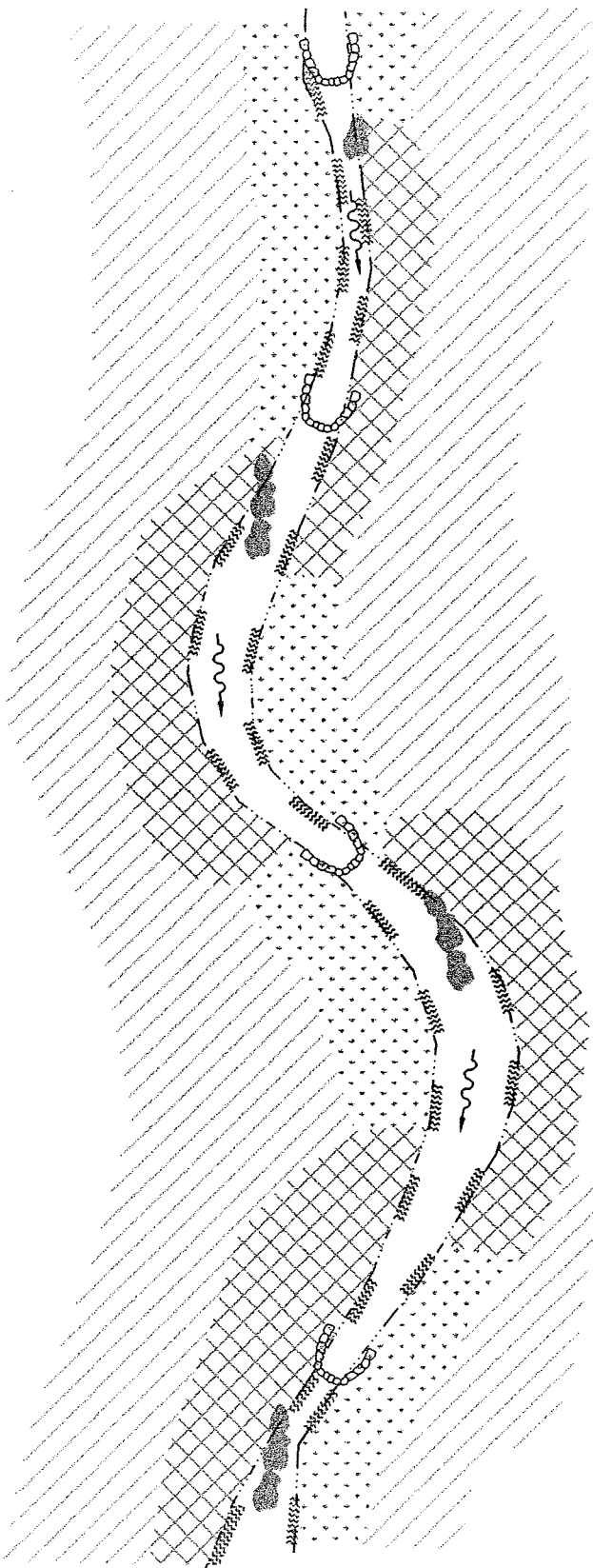
PARMA LAND DEVELOPMENT, LLC
D/A Processing No. 2000-00621(1)
Cuyahoga County, Ohio Quad: BROADVIEW
HEIGHTS
Sheet 14 of 41



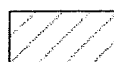





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CONSULTANTS, INC.

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STREAM A RELOCATION BIOENGINEERING TECHNIQUES
TYPICAL DETAIL - SECTION 1
BROADVIEW ROAD COMMERCIAL SITE
PARMA LAND DEVELOPMENT LLC
PARMA, CUYAHOGA COUNTY, OHIO



LEGEND

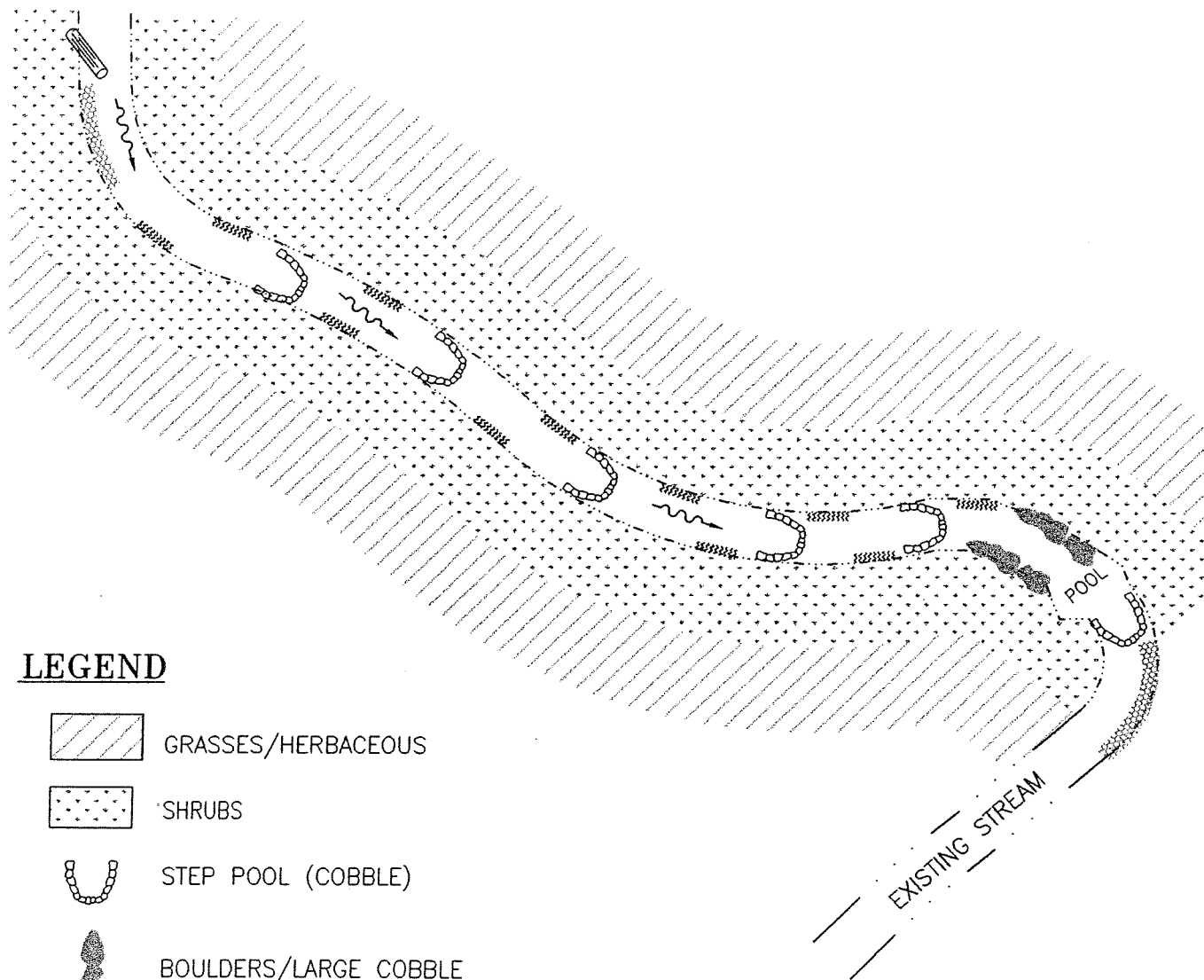
-  GRASSES/HERBACEOUS
-  FORESTED
-  SHRUBS
-  STEP POOL (COBBLE)
-  BOULDERS/LARGE COBBLE
-  ROOTMATS

PARMA LAND DEVELOPMENT, LLC
D/A Processing No. 2000-00621(1)
Cuyahoga County, Ohio Quad: BROADVIEW
HEIGHTS
Sheet 15 of 41

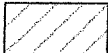






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STREAM A RELOCATION BIOENGINEERING TECHNIQUES
TYPICAL DETAIL - SECTION 2
BROADVIEW ROAD COMMERCIAL SITE
PARMA LAND DEVELOPMENT LLC
PARMA, CUYAHOGA COUNTY, OHIO



LEGEND

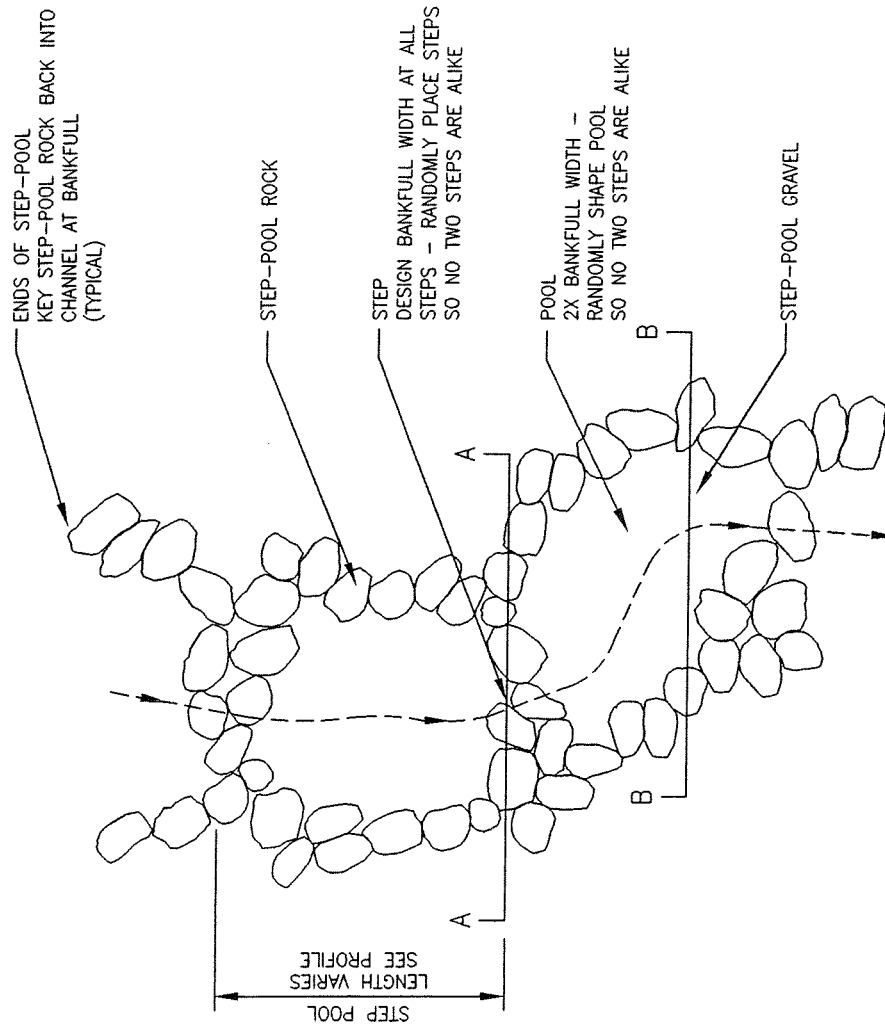
-  GRASSES/HERBACEOUS
-  SHRUBS
-  STEP POOL (COBBLE)
-  BOULDERS/LARGE COBBLE
-  ROOTWADS
-  ROOTMATS
-  LOG VANE

PARMA LAND DEVELOPMENT, LLC
D/A Processing No. 2000-00621(1)
Cuyahoga County, Ohio Quad: BROADVIEW
HEIGHTS
Sheet 16 of 41

STREAM A RELOCATION BIOENGINEERING TECHNIQUES
TYPICAL DETAIL - SECTION 3 AND
EXISTING STREAM - SECTION 4
BROADVIEW ROAD COMMERCIAL SITE
PARMA LAND DEVELOPMENT LLC
PARMA, CUYAHOGA COUNTY, OHIO

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STEP/POOL PLAN VIEW - TYPICAL

NOT TO SCALE

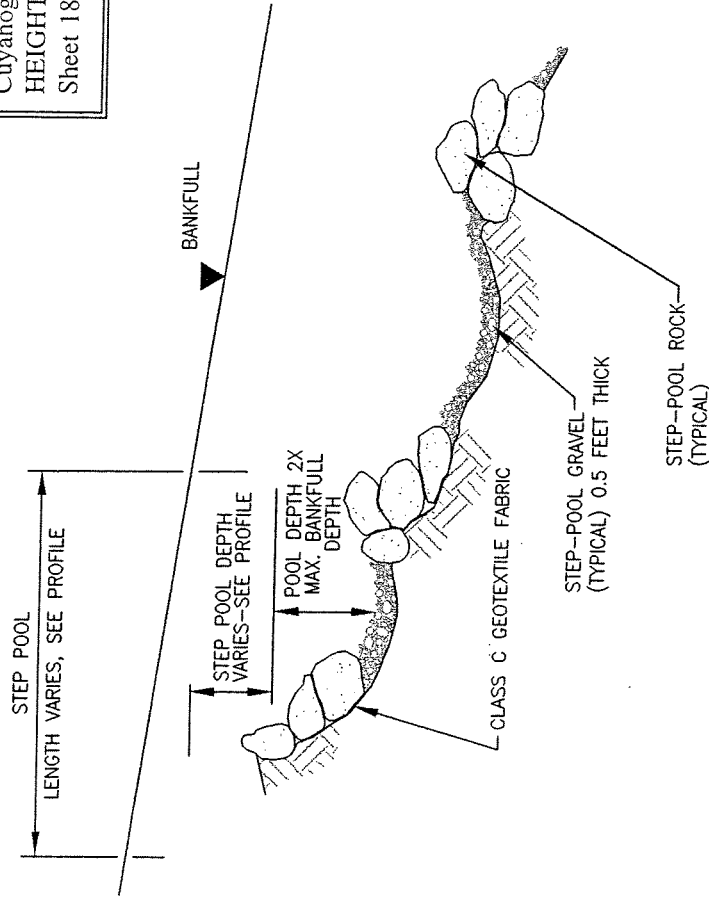
PARMA LAND DEVELOPMENT, LLC
D/A Processing No. 2000-00621(1)
Cuyahoga County, Ohio Quad: BROADVIEW
HEIGHTS
Sheet 17 of 41



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PARMA LAND DEVELOPMENT, LLC
D/A Processing No. 2000-00621(1)
Cuyahoga County, Ohio Quad: BROADVIEW
HEIGHTS
Sheet 18 of 41



STEP-POOL - SEQUENCE PROFILE - TYPICAL

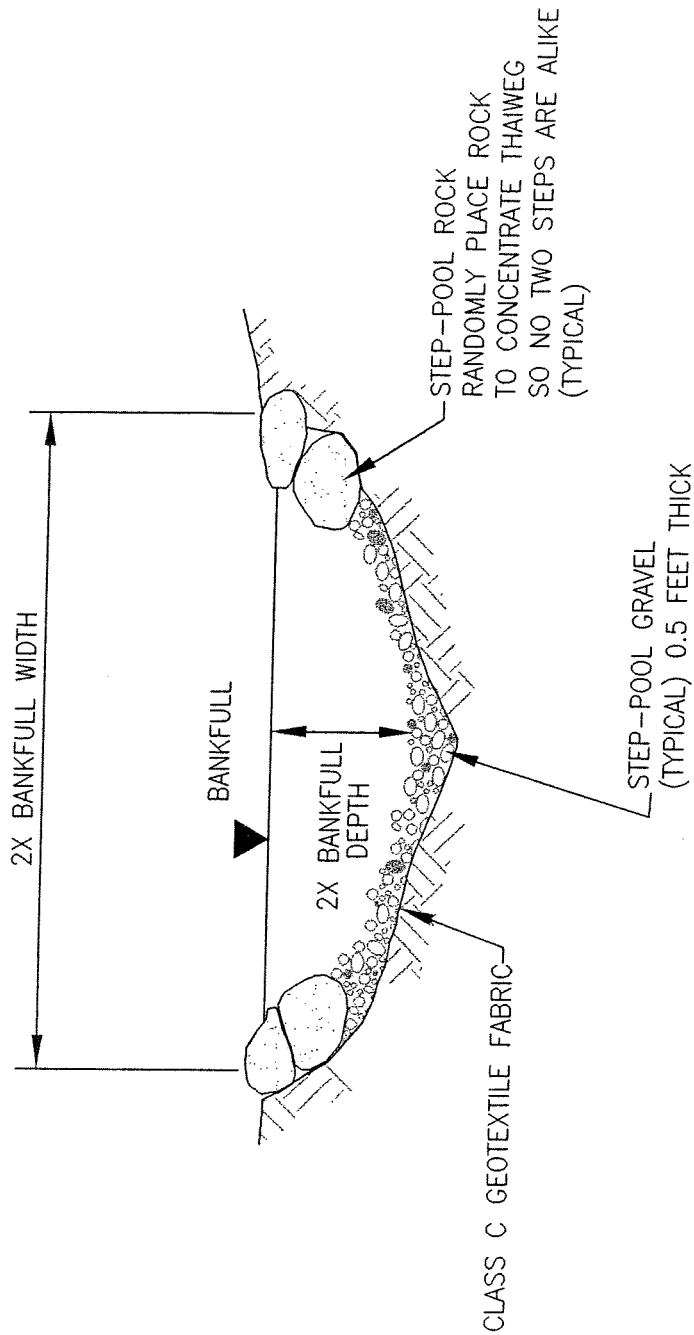
NOT TO SCALE

NOTE:
THESE DRAWINGS ARE NOT INTENDED TO BE A PRECISE REPRESENTATION OF ROCK PLACEMENT. ROCKS SHALL BE FIRMLY AND SECURELY PLACED IN A RANDOM MANNER WHILE MINIMIZING VOIDS AND AVOIDING WEAK POINTS BETWEEN ROCKS



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STEP-POOL - POOL "B-B"

NOT TO SCALE

PARMA LAND DEVELOPMENT, LLC
D/A Processing No. 2000-00621(1)
Cuyahoga County, Ohio Quad: BROADVIEW
HEIGHTS
Sheet 19 of 41

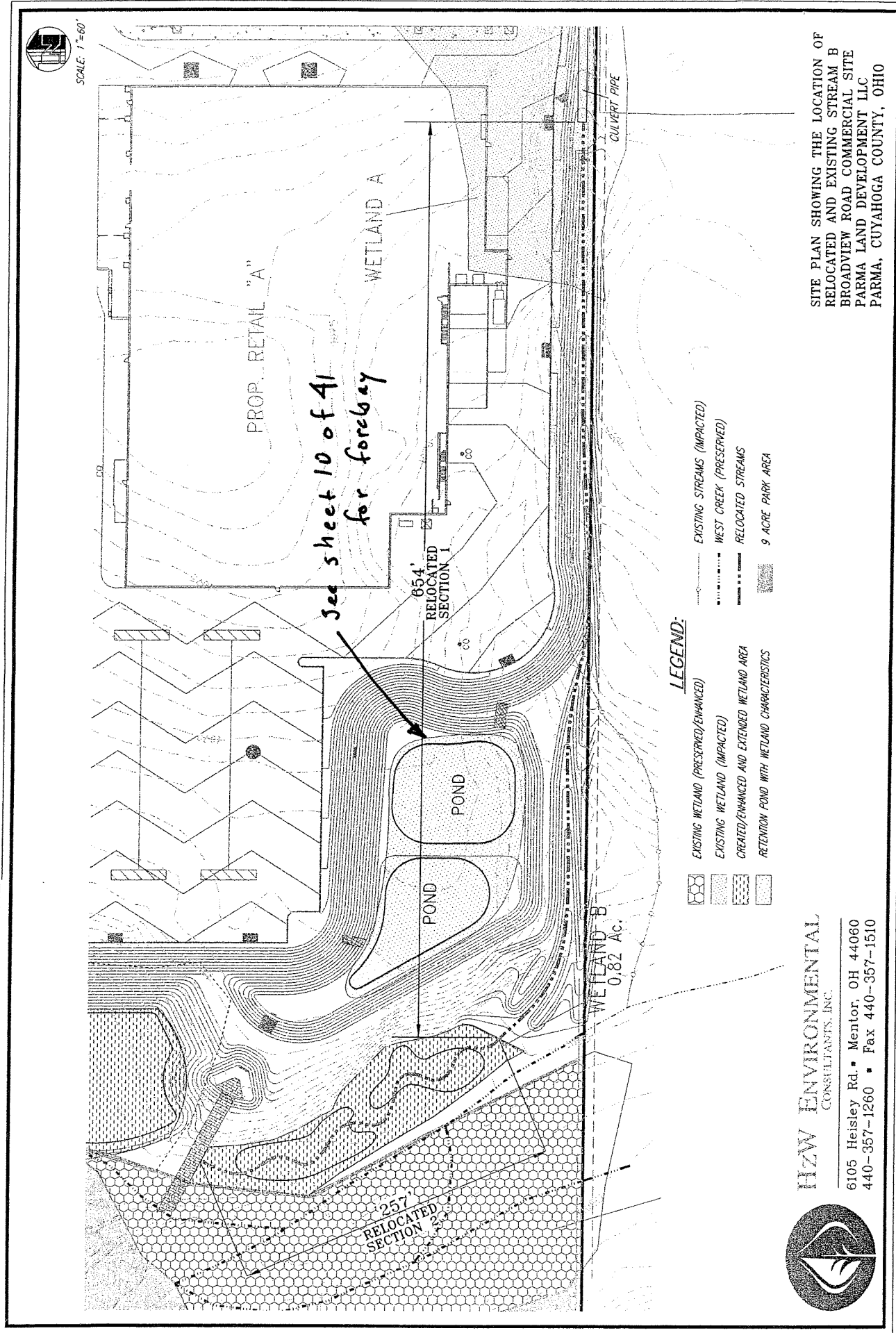


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PARMA LAND DEVELOPMENT, LLC
 D/A Processing No. 2000-00621(1)
 Cuyahoga County, Ohio Quad: BROADVIEW
 HEIGHTS
 Sheet 20 of 41

I:\H2M\1999\H9909704\CADDWCS\STREAMB.DWG (GMB) 6/7/01

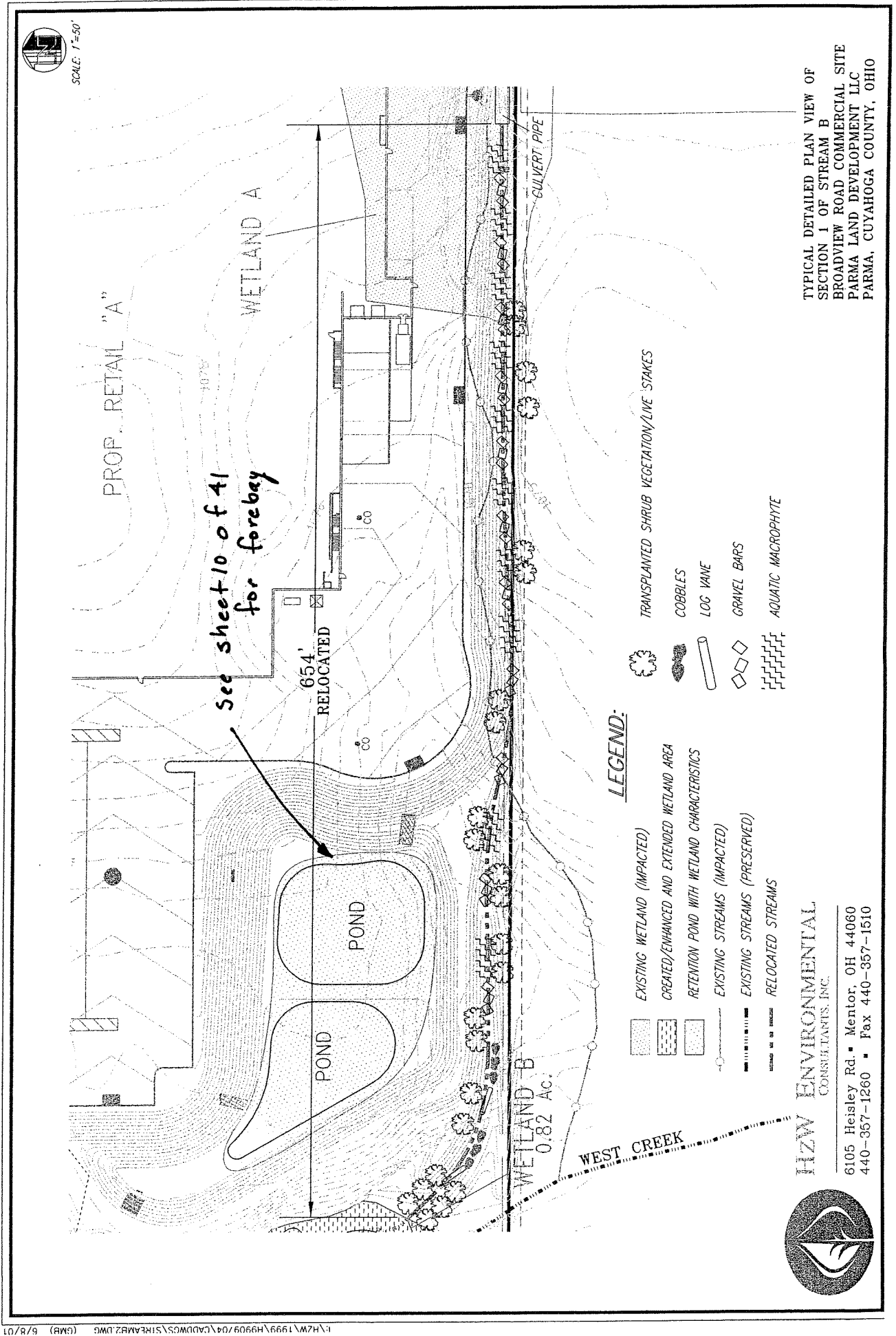


SITE PLAN SHOWING THE LOCATION OF
 RELOCATED AND EXISTING STREAM B
 BROADVIEW ROAD COMMERCIAL SITE
 PARMA LAND DEVELOPMENT LLC
 PARMA, CUYAHOGA COUNTY, OHIO

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 CONSULTANTS, INC.
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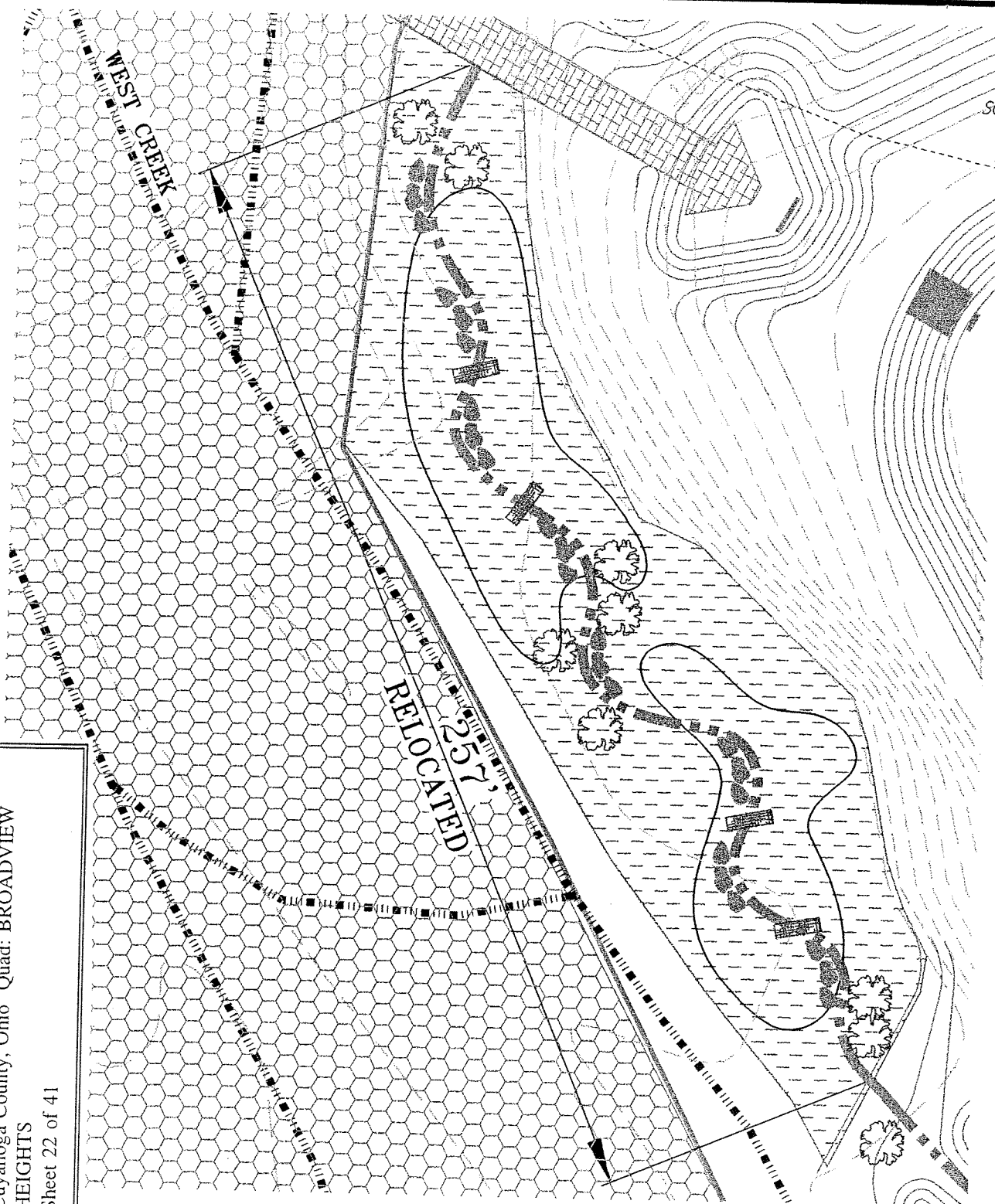
PARMA LAND DEVELOPMENT, LLC
D/A Processing No. 2000-00621(1)
Cuyahoga County, Ohio Quad: BROADVIEW
HEIGHTS
Sheet 21 of 41









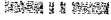


SCALE: 1"=30'

PARMA LAND DEVELOPMENT, LLC
D/A Processing No. 2000-00621(1)
Cuyahoga County, Ohio Quad: BROADVIEW
HEIGHTS
Sheet 22 of 41



LEGEND:

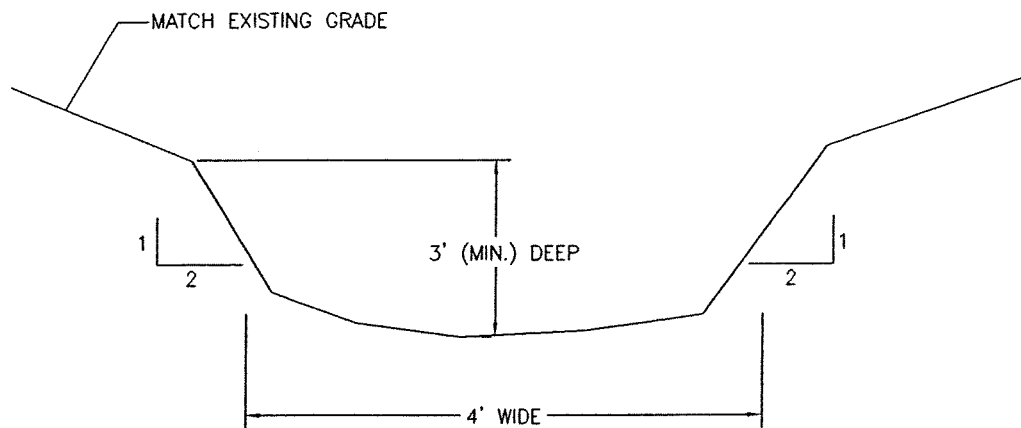
- | | | | |
|---|--|---|---|
|  | EXISTING WETLAND (PRESERVED/ENHANCED) |  | TRANSPLANTED SHRUB VEGETATION/LIVE STAKES |
|  | CREATED/ENHANCED AND EXTENDED WETLAND AREA |  | COBBLES |
|  | EXISTING STREAMS (PRESERVED) |  | WOODY DEBRIS |
|  | RELOCATED STREAMS | | |



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TYPICAL DETAILED PLAN VIEW OF
SECTION 2 OF STREAM B
BROADVIEW ROAD COMMERCIAL SITE
PARMA LAND DEVELOPMENT LLC
PARMA, CUYAHOGA COUNTY, OHIO



TYPICAL SECTION OF STREAM B
N.T.S.

PARMA LAND DEVELOPMENT, LLC
D/A Processing No. 2000-00621(1)
Cuyahoga County, Ohio Quad: BROADVIEW
HEIGHTS
Sheet 23 of 41



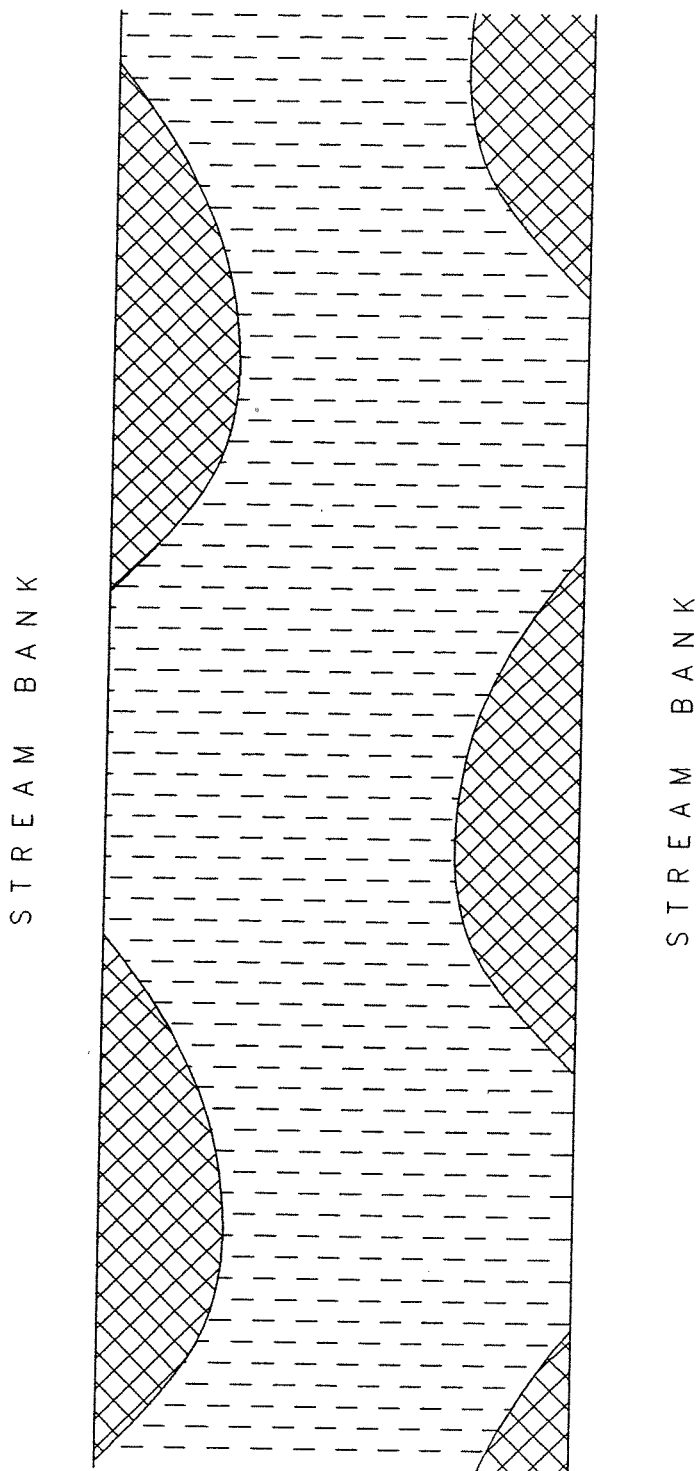
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CONSULTANTS, INC.

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TYPICAL SECTION OF STREAM B
RELOCATED AND EXISTING STREAM B
BROADVIEW ROAD COMMERCIAL SITE
PARMA LAND DEVELOPMENT LLC
PARMA, CUYAHOGA COUNTY, OHIO

TYPICAL PLAN VIEW OF GRAVEL BARS
IN SECTION 1 OF STREAM B

N.T.S.



LEGEND



STREAM



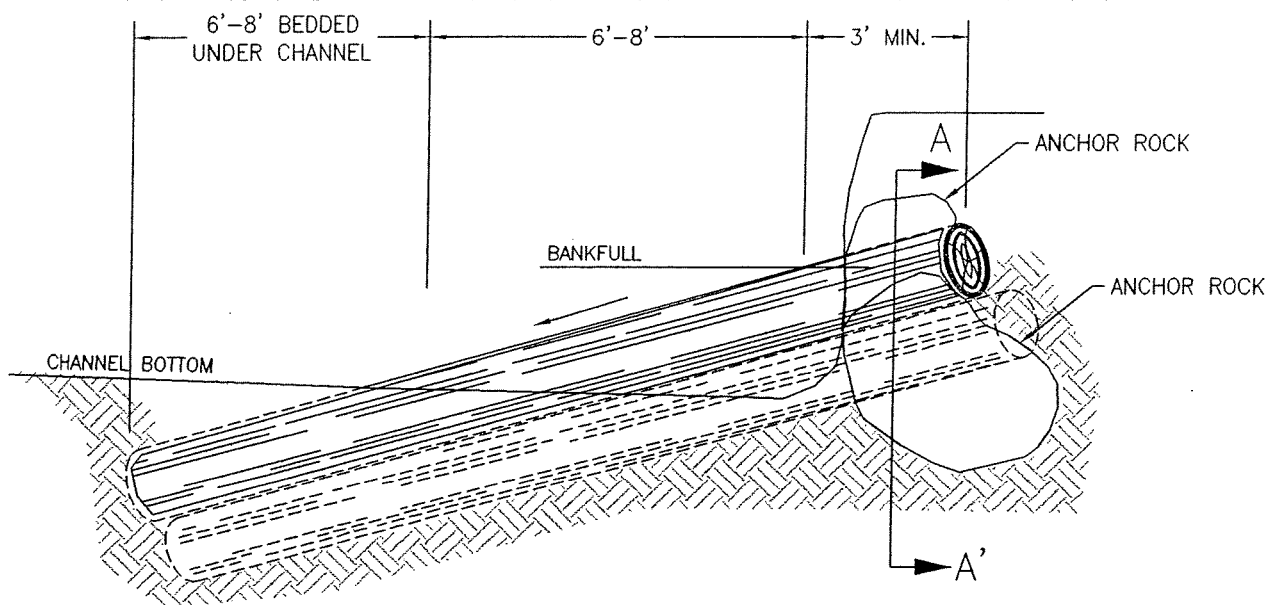
GRAVEL BAR



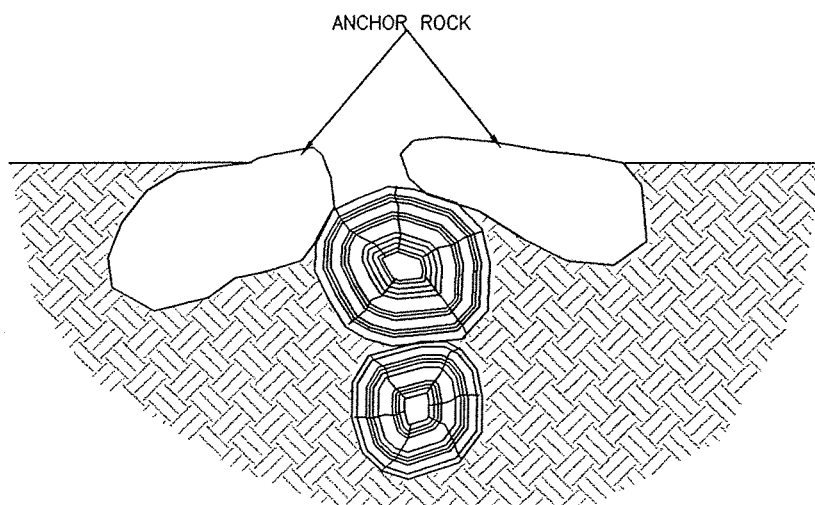
Hzw ENVIRONMENTAL
CONSULTANTS, INC.

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PARMA LAND DEVELOPMENT, LLC
D/A Processing No. 2000-00621(1)
Cuyahoga County, Ohio Quad: BROADVIEW
HEIGHTS
Sheet 24 of 41

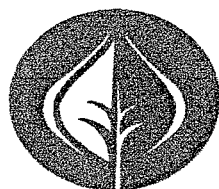


PROFILE ELEVATION
(N.T.S)



CROSS SECTION A-A'
(N.T.S)

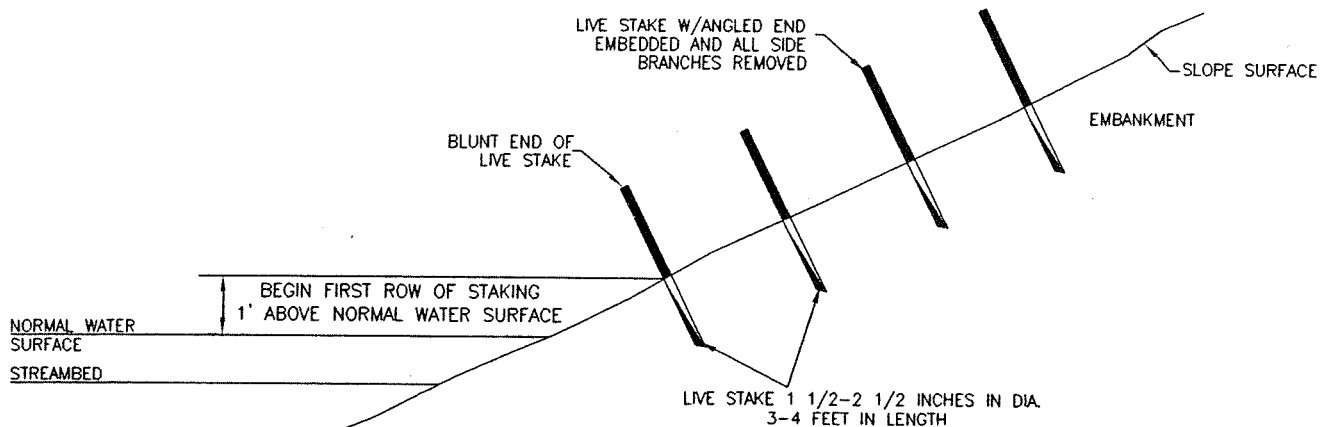
LOG VANE



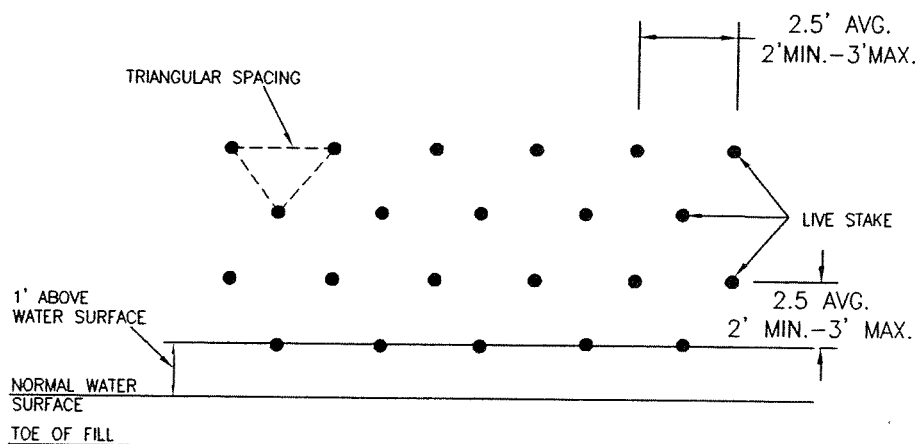
HW ENVIRONMENTAL
CONSULTANTS, INC.

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440-357-1260 ■ Fax 440-357-1510

PARMA LAND DEVELOPMENT, LLC
D/A Processing No. 2000-00621(1)
Cuyahoga County, Ohio Quad: BROADVIEW
HEIGHTS
Sheet 25 of 41



TYPICAL SECTION
(N.T.S.)



FRONT VIEW
(N.T.S.)

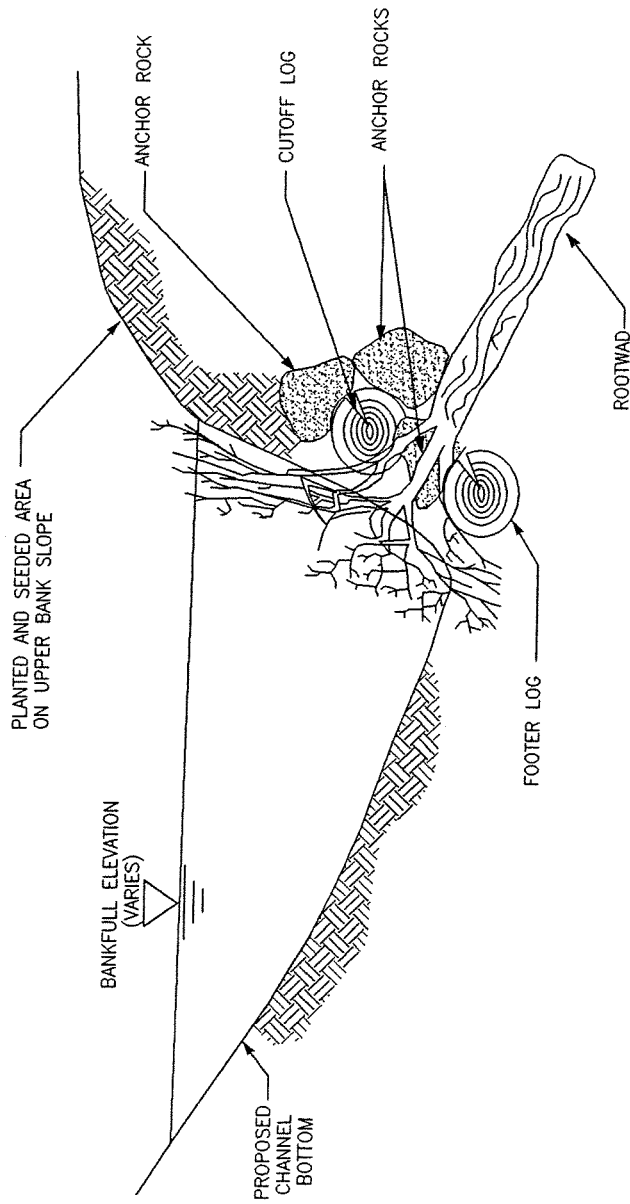
LIVE STAKE PLANTING



HZW ENVIRONMENTAL
CONSULTANTS, INC.

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440-357-1260 ■ Fax 440-357-1510

PARMA LAND DEVELOPMENT, LLC
D/A Processing No. 2000-00621(1)
Cuyahoga County, Ohio Quad: BROADVIEW
HEIGHTS
Sheet 26 of 41



ROOTWAD

CROSS SECTION

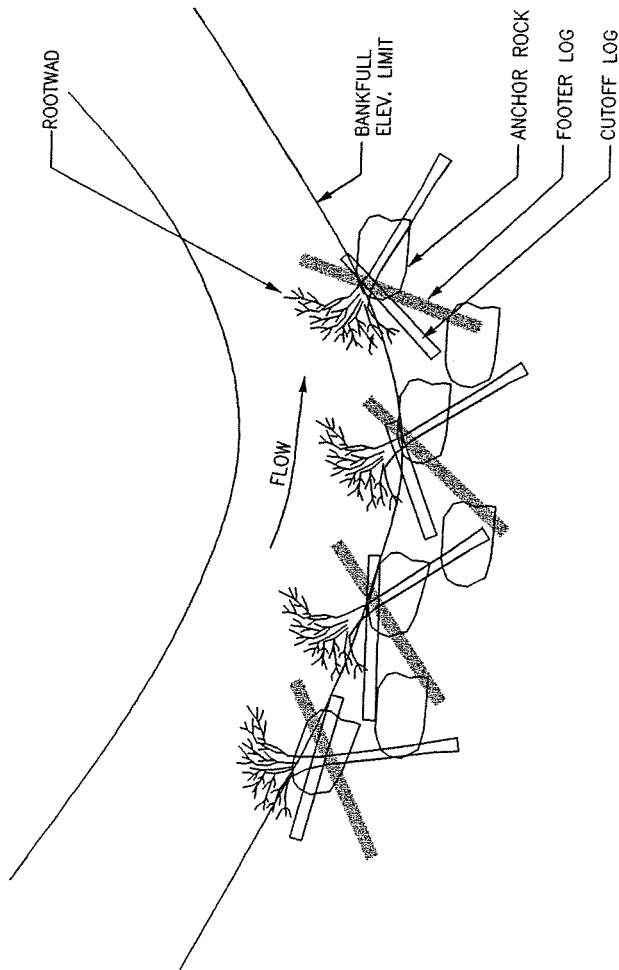
NOT TO SCALE



H2W ENVIRONMENTAL
CONSULTANTS, INC.

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440-357-1260 • Fax 440-357-1510

PARMA LAND DEVELOPMENT, LLC
D/A Processing No. 2000-00621(1)
Cuyahoga County, Ohio Quad: BROADVIEW
HEIGHTS
Sheet 27 of 41



ROOTWADS
PLAN VIEW

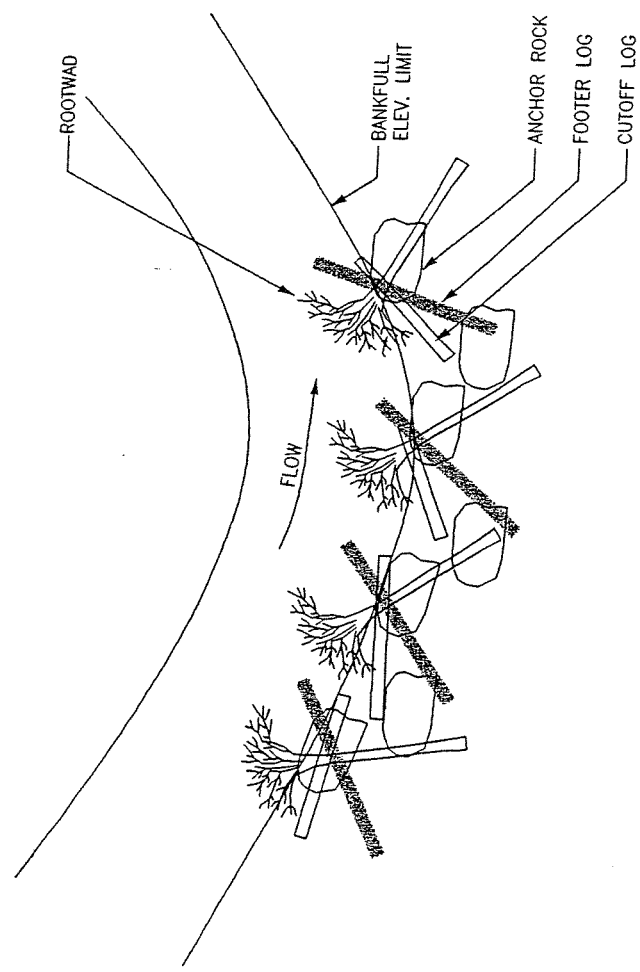
NOT TO SCALE

PARMA LAND DEVELOPMENT, LLC
D/A Processing No. 2000-00621(1)
Cuyahoga County, Ohio Quad: BROADVIEW
HEIGHTS
Sheet 28 of 41



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PARMA LAND DEVELOPMENT, LLC
D/A Processing No. 2000-00621(1)
Cuyahoga County, Ohio Quad: BROADVIEW
HEIGHTS
Sheet 29 of 41



ROOTWADS
PLAN VIEW

NOT TO SCALE

CONFIDENTIAL








HZW ENVIRONMENTAL
CONSULTANTS, INC.
6105 Halsey Rd. • Mentor, OH 44090
440-357-1200 • Fax 440-357-1510

PARMA LAND DEVELOPMENT, LLC
D/A Processing No. 2000-00621(1)
Cuyahoga County, Ohio Quad: BROADVIEW
HEIGHTS
Sheet 30 of 41

HzW ENVIRONMENTAL
CONSULTANTS, INC.

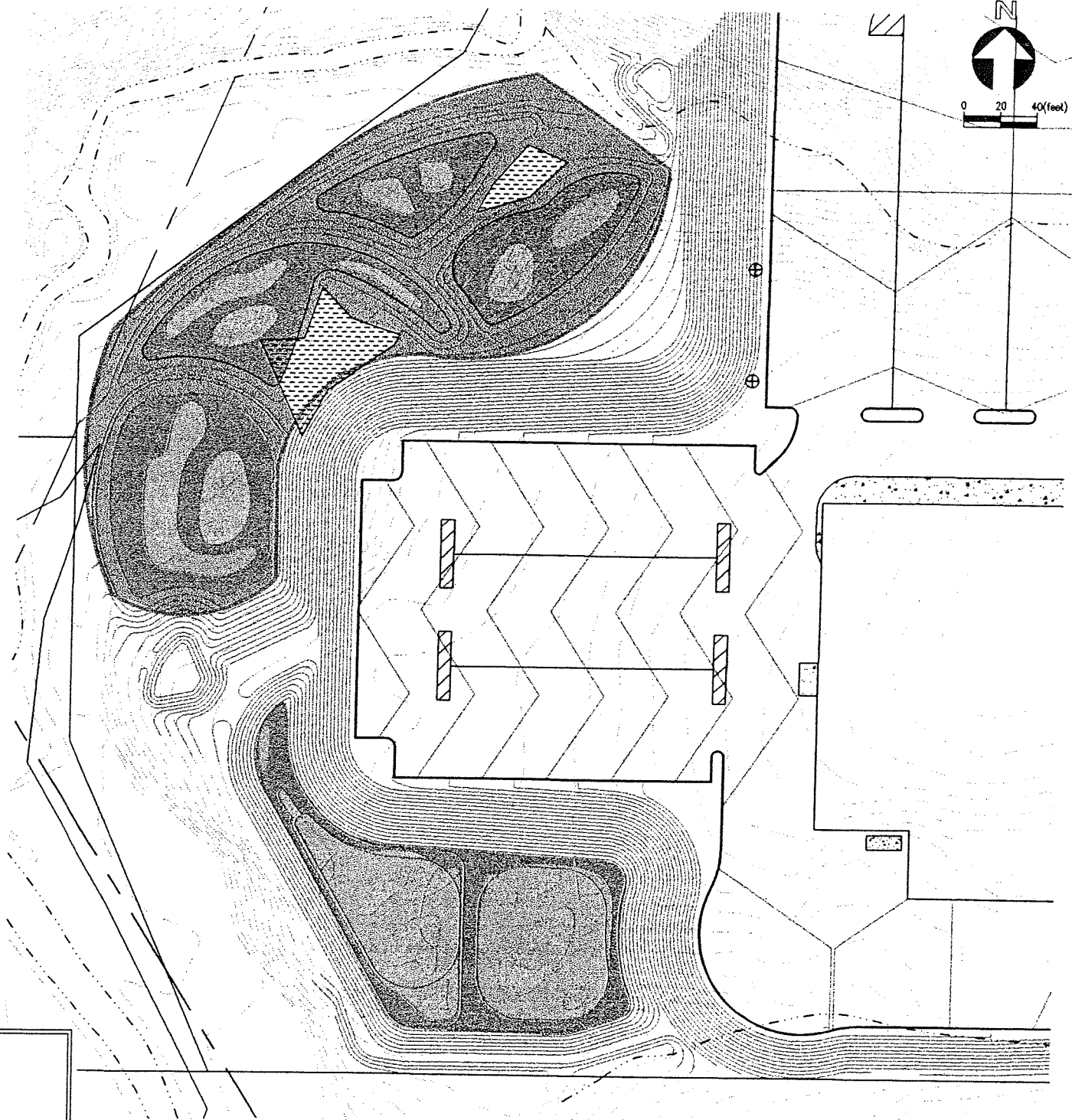
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LEGEND:

- | | | | |
|---|-----------------------------|---|--|
|  | EXISTING WETLAND |  | EMERGENT (6-12 INCHES) |
|  | SHRUB/FORESTED (0-6 INCHES) |  | EMERGENT/FLOATING AQUATIC (12-36 INCHES) |
|  | EMERGENT (0-6 INCHES) | | |

PLANTING PLAN FOR
ENHANCED AND EXPANDED WETLAND C AND D
AND FOR THE STORM RETENTION BASINS

CONFIDENTIAL

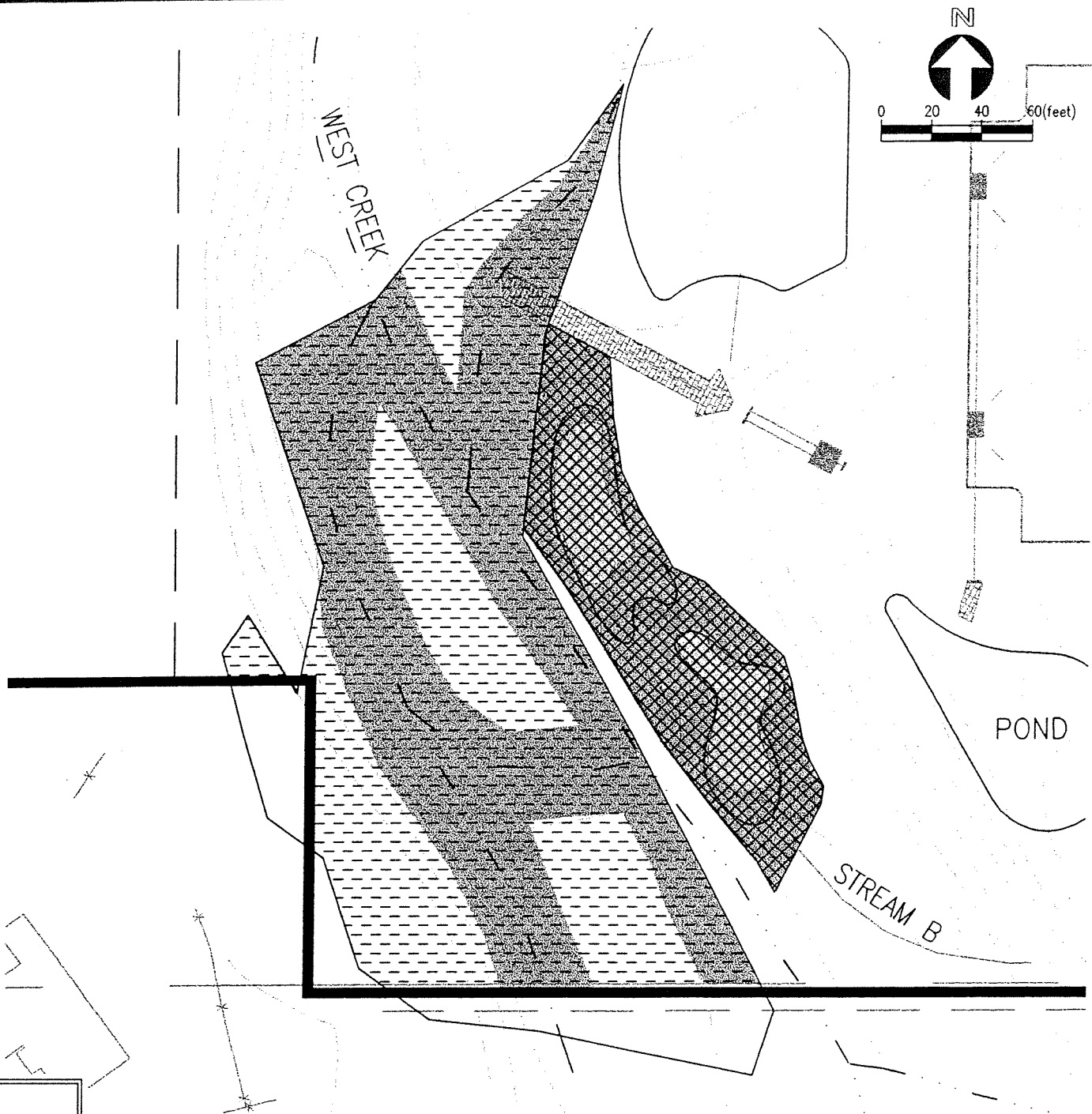


Potential Planting Plan for the Wet Retention Basins and Created Wetland Area at the Broadview Road Commercial Site




LOCATION	WATER DEPTH	COMMON NAME	SCIENTIFIC NAME	COMMUNITY*	WILDLIFE VALUE*	ADDITIONAL SOIL VALUE*	ADDITIONAL WATER QUALITY VALUE
Retention Basin	0 to 6 inches	Rice Cutgrass	<i>Leersia oryzoides</i>	Emergent	Excellent	Sediment Stabilization	Nutrient Removal•
Retention Basin	0 to 6 inches	Red Clover	<i>Trifolium pratense</i>	Herbaceous	Not Available	Not Available	Phytoremediation (Phytoextraction/Rhizodegradation)°
Retention Basin	0 to 6 inches	Red Fescue	<i>Festuca rubra</i>	Herbaceous	Not Available	Soil Stabilization	Phytoremediation (Phytoextraction)°
Retention Basin	0 to 6 inches	Tall Sunflower	<i>Helianthus giganteus</i>	Herbaceous	Excellent	Not Available	Phytoremediation (Rhizofiltration)°
Retention Basin	0 to 6 inches	Saw-Tooth Sunflower	<i>Helianthus grosseserratus</i>	Herbaceous	Excellent	Not Available	Phytoremediation (Rhizofiltration)°
Retention Basin	6 to 12 inches	Prairie Cordgrass	<i>Spartina pectinata</i>	Emergent	Excellent	Not Available	Phytoremediation (Rhizofiltration)°
Retention Basin	6 to 12 inches	Broad-Leaved Arrowhead	<i>Sagittaria latifolia</i>	Emergent	Excellent	Soil Stabilization	Nutrient Removal•, Heavy Metal Uptake+, Saline Tolerant*
Retention Basin	12 to 36 inches	Big Cordgrass	<i>Spartina cynosuroides</i>	Emergent	Excellent	Not Available	Nutrient Uptake↑, Heavy Metal Uptake↑
Wetland Areas	0 to 6 inches	Box Elder	<i>Acer negundo</i>	Forested	Excellent	Soil Stabilization	Nutrient Removal•, Heavy Metal Uptake+, Saline Tolerant*
Wetland Areas	0 to 6 inches	Green Ash	<i>Fraxinus pennsylvanica</i>	Forested	Excellent	Soil Stabilization	Shading, Tolerates Drought*
Wetland Areas	0 to 6 inches	Red-Osier Dogwood	<i>Cornus stolonifera</i>	Shrub	Excellent	Soil Stabilization	Shading, Insensitive to Disease, Tolerates Drought*
Wetland Areas	0 to 6 inches	Nannyberry	<i>Viburnum lentago</i>	Shrub	Excellent	Soil Stabilization	Shading, Tolerates Drought*
Wetland Areas	0 to 6 inches	Rice Cutgrass	<i>Leersia oryzoides</i>	Emergent	Excellent	Soil Stabilization	Shading*
Wetland Areas	0 to 6 inches	Pennsylvania Smartweed	<i>Polygonum pensylvanicum</i>	Emergent	Excellent	Sediment Stabilization	Nutrient Removal•
Wetland Areas	0 to 6 inches	Common Three Square	<i>Scirpus pungens</i>	Emergent	Excellent	Erosion Control	Not Available
Wetland Areas	6 to 12 inches	River Bulrush	<i>Scirpus fluviatilis</i>	Emergent	Excellent	Soil Stabilizer	Heavy Metal Uptake≈
Wetland Areas	6 to 12 inches	Broad-Leaf Cattail	<i>Typha latifolia</i>	Emergent	Excellent	Erosion Control	Nutrient Removal•, Heavy Metal Uptake≈
Wetland Areas	6 to 12 inches	Soft Stem Bulrush	<i>Scirpus validus</i>	Emergent	Excellent	Soil Stabilization	Heavy Metal Uptake≈
Wetland Areas	6 to 12 inches				Excellent	Not Available	Heavy Metal Uptake≈

Please refer to list of Literature Cited on Page 2.

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LEGEND:

- | | | | |
|---|------------------|---|------------------------|
|  | EXISTING WETLAND |  | SHRUB/FORESTED |
|  | PROPOSED WETLAND |  | EMERGENT (0-6 INCHES) |
| | |  | EMERGENT (6-12 INCHES) |

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PLANTING PLAN FOR
 ENHANCED AND EXPANDED WETLAND B

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Potential Planting Plan for the Created Wetland Area and Enhancement of Wetland B at the Broadview Road Commercial Site

LOCATION	WATER DEPTH	COMMON NAME	SCIENTIFIC NAME	COMMUNITY*	WILDLIFE VALUE*	ADDITIONAL SOIL VALUE*	ADDITIONAL WATER QUALITY VALUE
Wetland Areas	0 to 6 inches	Box Elder	<i>Acer negundo</i>	Forested	Excellent	Soil	Shading, Tolerates Drought*
Wetland Areas	0 to 6 inches	Green Ash	<i>Fraxinus pennsylvanica</i>	Forested	Excellent	Soil	Shading, Insensitive to Disease, Tolerates Drought*
Wetland Areas	0 to 6 inches	Red-Osier Dogwood	<i>Cornus stolonifera</i>	Shrub	Excellent	Soil	Shading, Tolerates Drought*
Wetland Areas	0 to 6 inches	Nannyberry	<i>Viburnum lentago</i>	Shrub	Excellent	Soil	Shading*
Wetland Areas	0 to 6 inches	Rice Cutgrass	<i>Leersia oryzoides</i>	Emergent	Excellent	Sediment	Nutrient Removal•
Wetland Areas	0 to 6 inches	Pennsylvania Smartweed	<i>Polygonum pennsylvanicum</i>	Emergent	Excellent	Stabilization	Not Available
Wetland Areas	0 to 6 inches	Common Three Square	<i>Scirpus pungens</i>	Emergent	Excellent	Erosion Control	Heavy Metal Uptakes≈
Wetland Areas	6 to 12 inches	River Bulrush	<i>Scirpus fluviatilis</i>	Emergent	Excellent	Soil Stabilizer	Nutrient Removal•, Heavy Metal Uptakes≈
Wetland Areas	6 to 12 inches	Broad-Leaf Cattail	<i>Typha latifolia</i>	Emergent	Excellent	Erosion Control	Heavy Metal Uptakes≈
Wetland Areas	6 to 12 inches	Soft Stem Bulrush	<i>Scirpus validus</i>	Emergent	Excellent	Soil	Heavy Metal Uptakes≈
Wetland Areas	6 to 12 inches			Emergent	Excellent	Stabilization	Heavy Metal Uptakes≈
Wetland Areas	6 to 12 inches			Emergent	Excellent	Not Available	Heavy Metal Uptakes≈

* Information Obtained from Wetland Planting Guide for the Northeastern United States: Plants for Wetland Creation, Restoration, and Enhancement by Gwendolyn A. Thunhorst Published in 1993 by Environmental Concern, Inc.

• Information Obtained from A Guide to Wetland Function Design by Anne D. Marble Published in 1992 by Lewis Publishers

≈ Information Obtained from "Phytoremediation from Lead-Contaminated River Sediments" by The Bioengineering Group, Inc. Located on

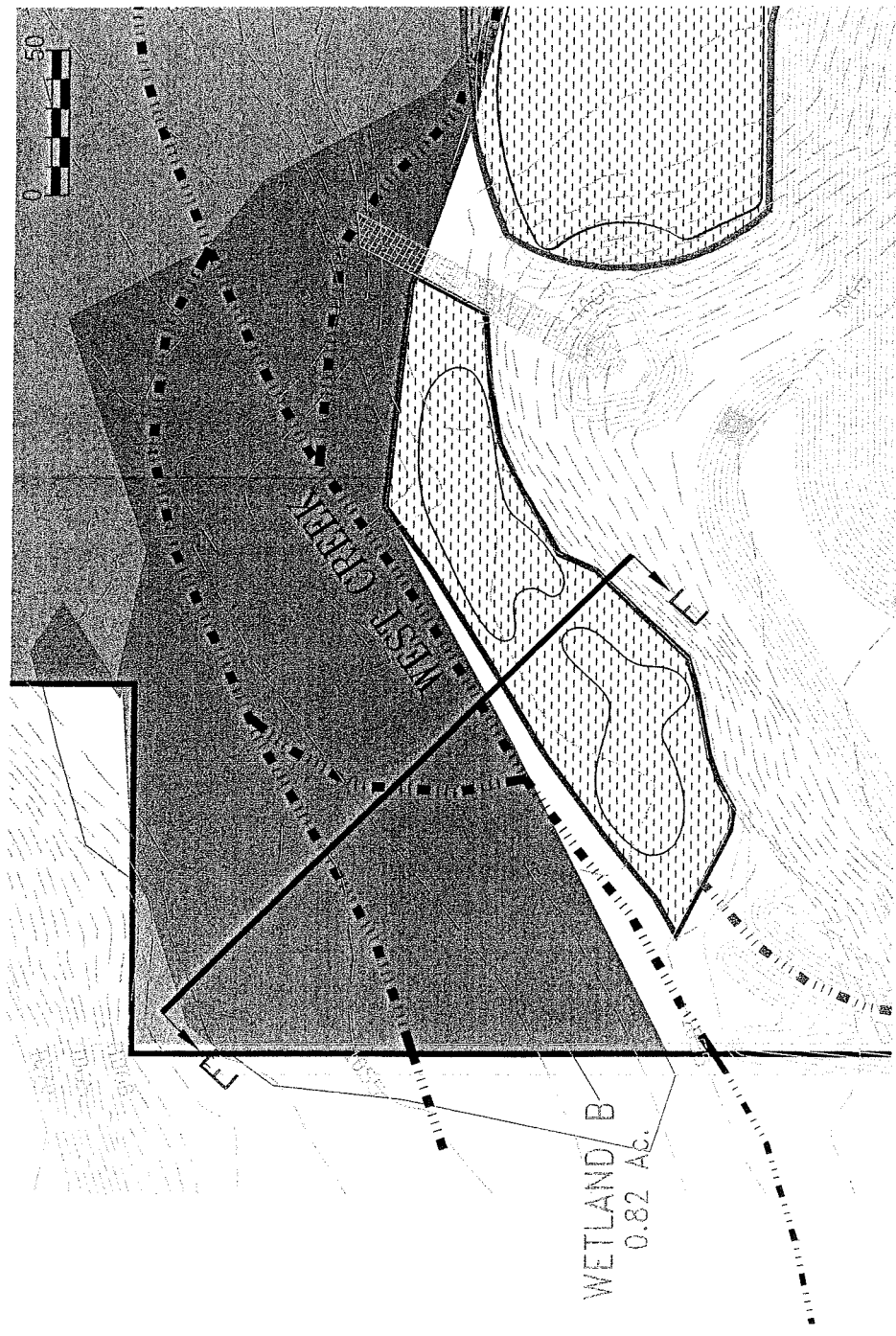
<http://www.bioengineering.com/phytoremediation.html>

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Cuyahoga County, Ohio Quad: BROADVIEW HEIGHTS
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LEGEND:

- EXISTING WETLAND (PRESERVED/ENHANCED)
- CREATED/ENHANCED AND EXTENDED WETLAND AREA
- 9 ACRE PARK AREA
- EXISTING STREAMS (PRESERVED)
- RELOCATED STREAMS



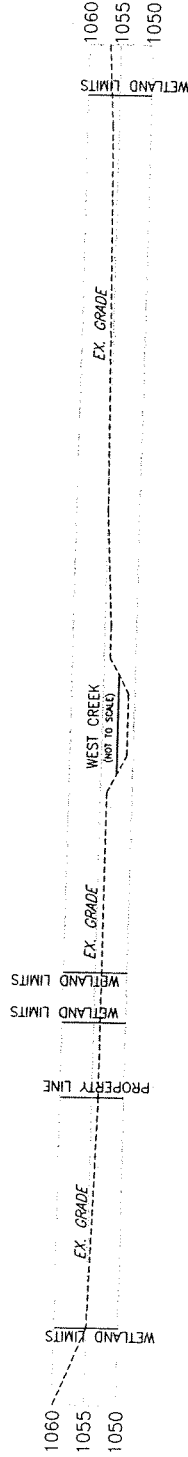
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NOTE: BASE MAP PREPARED BY NEFF AND ASSOCIATES, INC.

CROSS SECTION LOCATION OF
 EXISTING AND EXPANDED
WETLAND B
 PARMA LAND DEVELOPMENT
 CITY OF PARMA, CUYAHOGA COUNTY, OHIO

ENHANCED WETLAND "B" & EXISTING WETLAND "B"



SECTION "E-E"



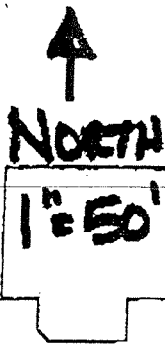
PARMA LAND DEVELOPMENT, LLC
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Cuyahoga County, Ohio Quad: BROADVIEW
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CROSS SECTION DETAIL FOR
EXISTING AND EXPANDED
WETLAND B
PARMA LAND DEVELOPMENT
CITY OF PARMA, CUYAHOGA COUNTY, OHIO

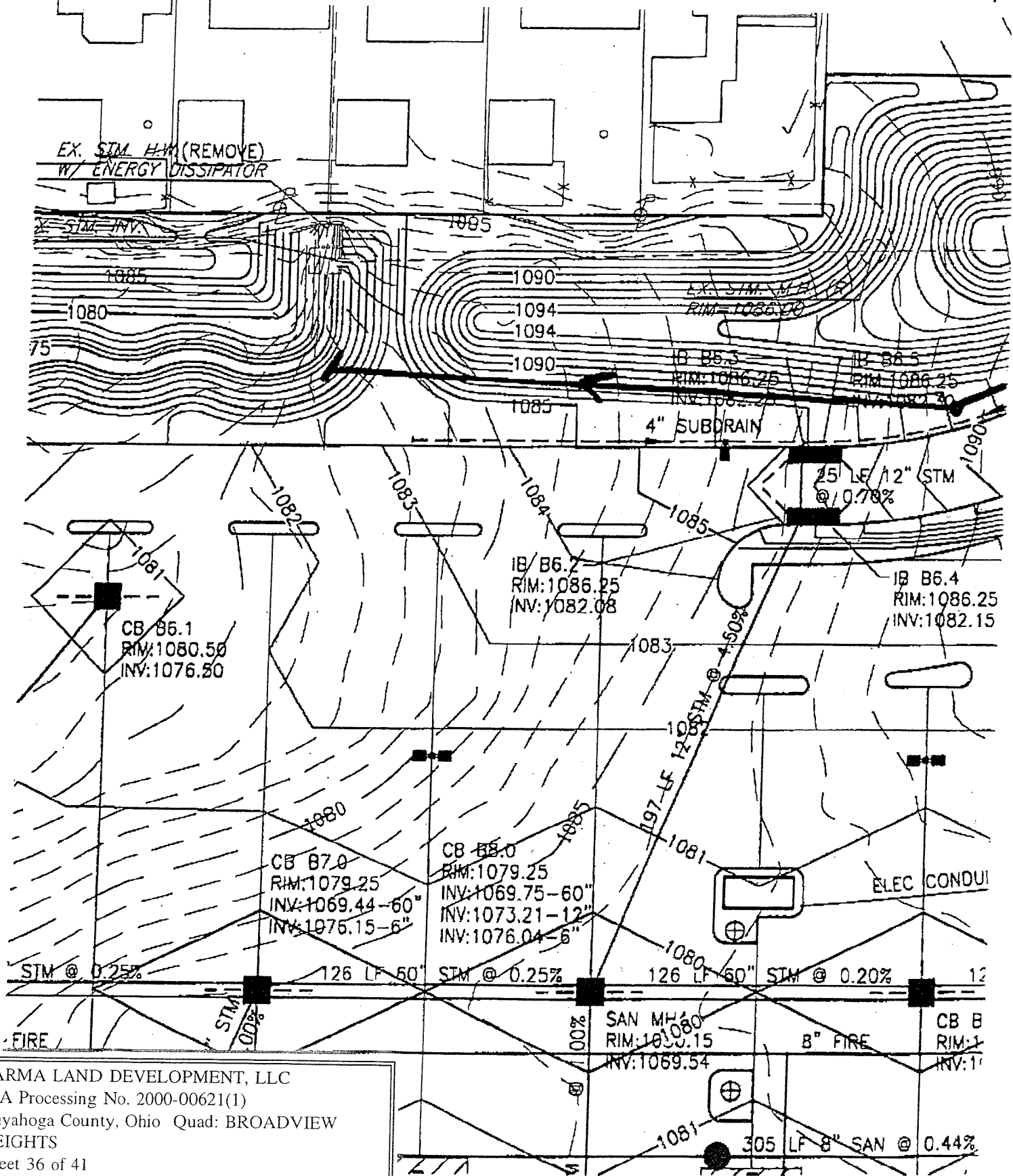
NOTE: BASE MAP PREPARED BY NEFF AND ASSOCIATES, INC.



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DETAILS: PROPOSED CONTROL SYSTEM
TO MAINTAIN LOW FLOW WATER TO STREAM A
1 OF 4

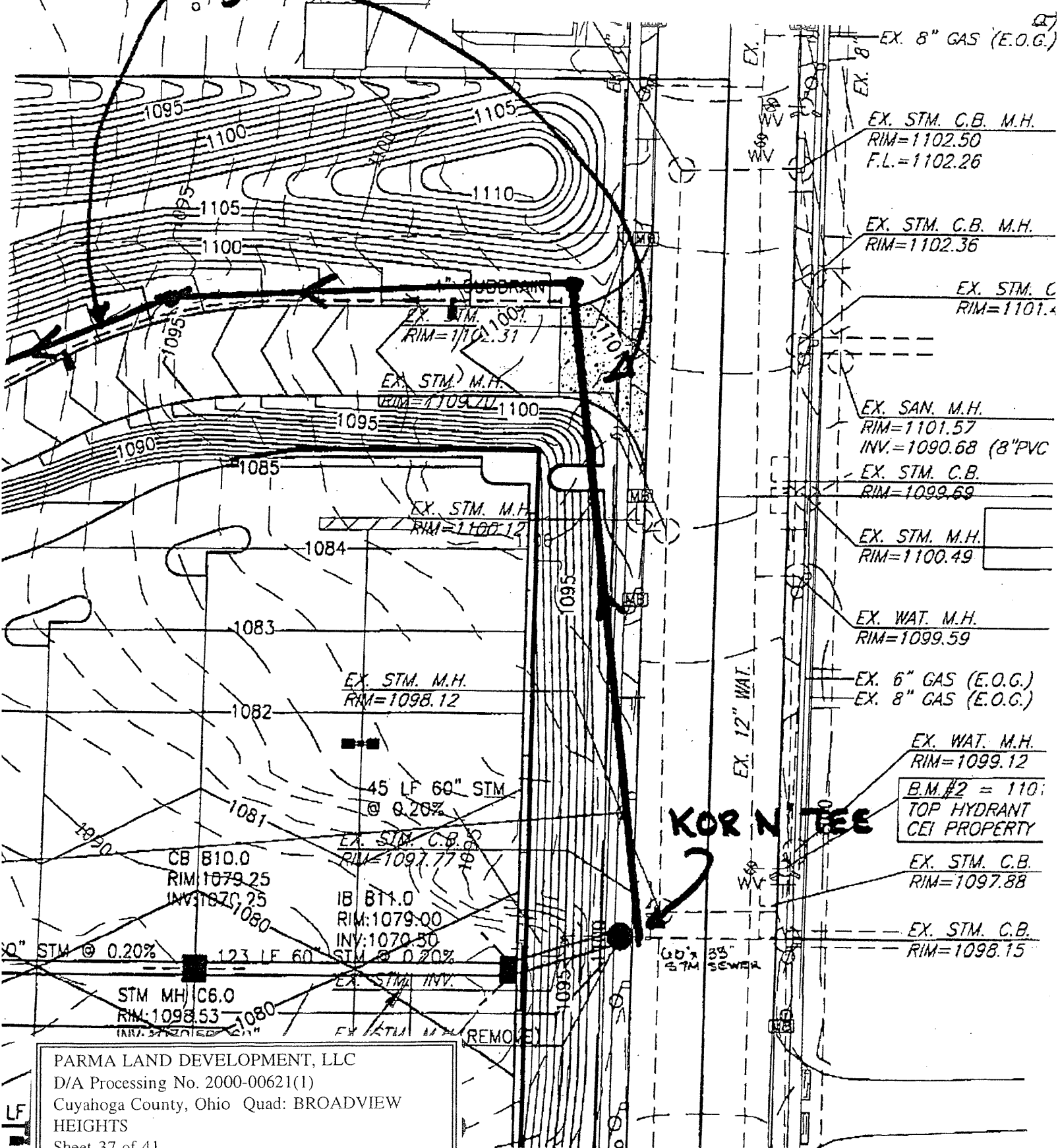


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**PROP. STM
SEWER**

**DETAILS: PROPOSED CONTROL SYSTEM
TO MAINTAIN LOW FLOW WATER TO STREAM A
2 OF 4**



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LOCATION BROADVIEW ROAD RETAIL CENTER

JOB NO. 11858

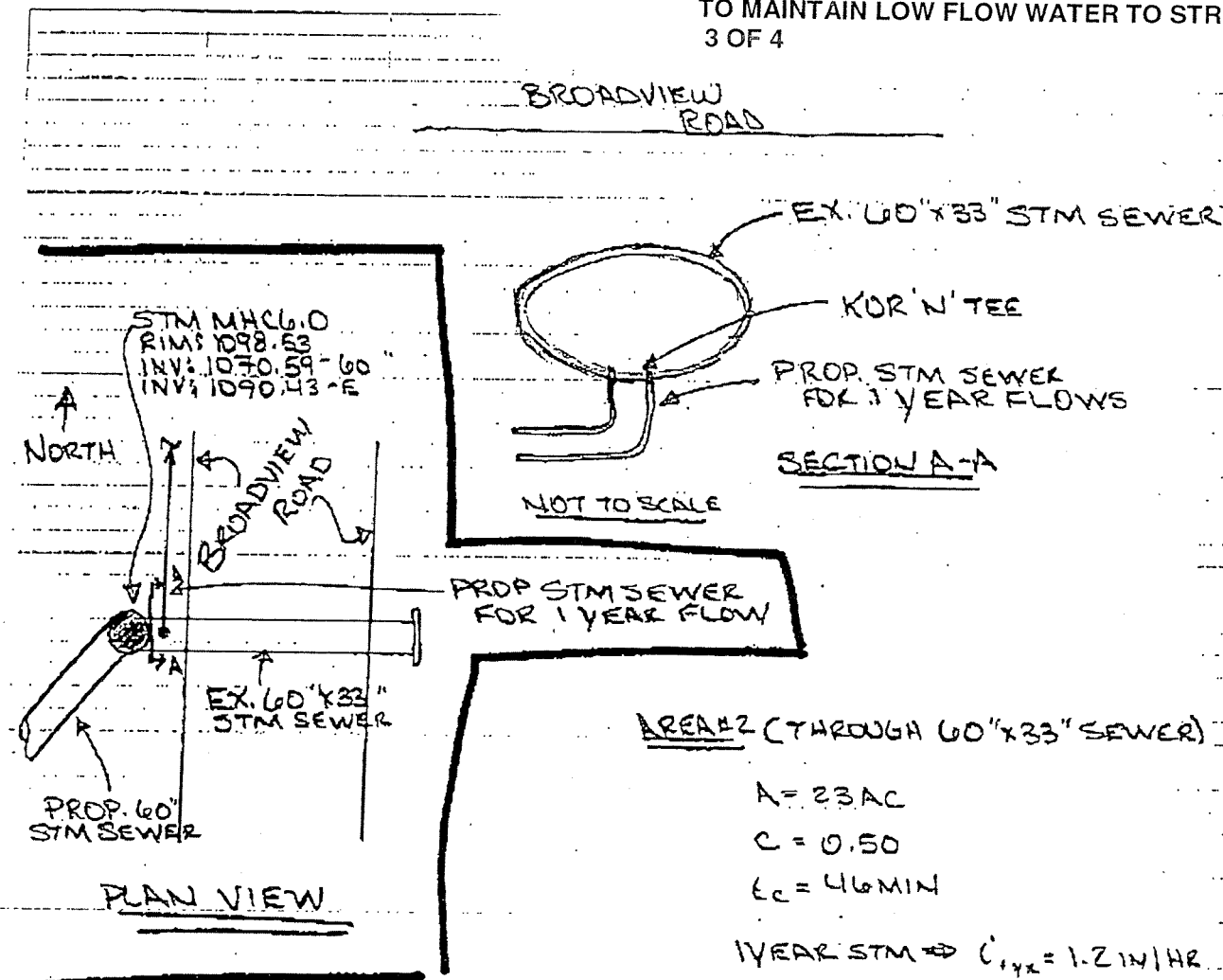
SUBJECT _____

SHEET NO _____

COMPUTED BY JGG DATE 5/24/01 CHECKED BY _____ DATE _____

OF _____

DETAILS: PROPOSED CONTROL SYSTEM
TO MAINTAIN LOW FLOW WATER TO STREAM A
3 OF 4



AREA 2 (THROUGH 60" x 33" SEWER)

$$A = 23.4C$$

$$C = 0.50$$

$$E_c = 46 \text{ MIN}$$

$$1 \text{ YEAR STM } C_{1yr} = 1.2 \text{ IN/HR}$$

$$Q_{1yr} = AC C_{1yr}$$

$$= (23.4C)(0.50)(1.2 \text{ IN/HR})$$

$$= \underline{13.8 \text{ CFS}}$$

18" PVC @ 1.50%

$$Q = \frac{CMA R^{2/3} S^{1/2}}{n} = \frac{(1.486)(\pi 0.75^2)(1.5)^{2/3}(0.015)^{1/2}}{0.011}$$

$$Q = \underline{15.2 \text{ CFS}}$$

PARMA LAND DEVELOPMENT, LLC
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LOCATION BROADVIEW ROAD - PARMA

SUBJECT _____

JOB NO. 11858

SHEET NO _____

COMPUTED BY JG G DATE 06/08/01 CHECKED BY _____ DATE _____

OF _____

10 YEAR STM \Rightarrow 16.04 CFS ALLOWABLE RUN-OFF FOR ON-SITE

$$Q = \frac{C \cdot M \cdot A \cdot R^{2/3} \cdot S^{1/2}}{n}$$

USE 18" PIPE AT 3.10%

$$Q = \frac{1.486(\pi)(1.5/2)^2(1.5/4)^{2/3}(0.031)^{1/2}}{0.015} = 16.03 \text{ CFS} \approx 16.04 \text{ CFS}$$

TOP END INV: 1056.50

22LF 18" STM @ 3.10%

BOTTOM END INV: 1055.82

DETAILS: PROPOSED CONTROL SYSTEM
TO MAINTAIN LOW FLOW WATER TO STREAM A
4 OF 4

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MONITORING PLAN

PARMA LAND DEVELOPMENT, LLC
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Cuyahoga County, Ohio Quad: BROADVIEW
HEIGHTS
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NOTE: MAY 11, 2001 MARKUP FOR INCLUSION IN PLD MONITORING PROGRAM WAS GIVEN TO OAC

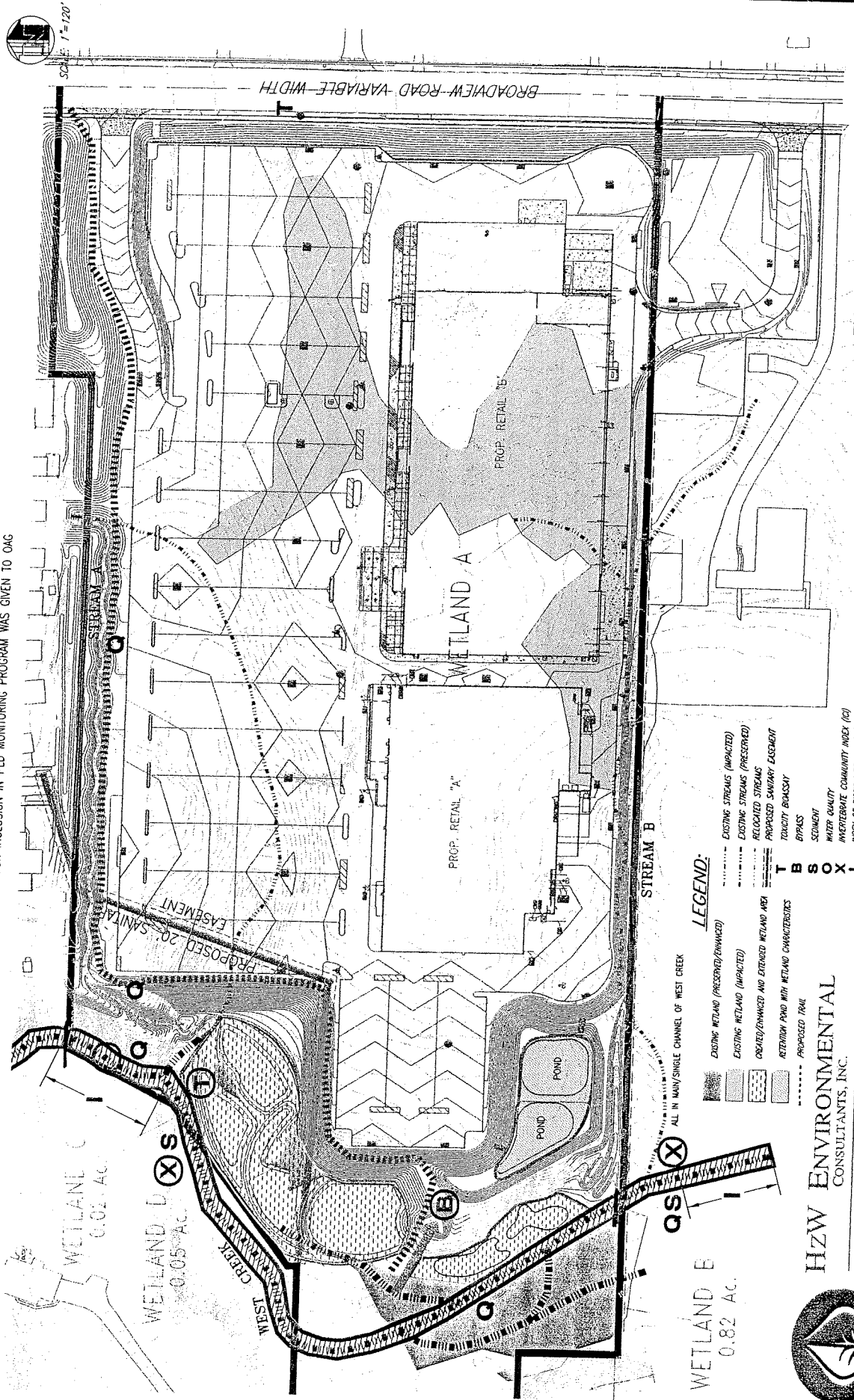


FIGURE 3.1

APPROXIMATE BENCHMARK LOCATIONS FOR
PARMA LAND DEVELOPMENT MONITORING PLAN

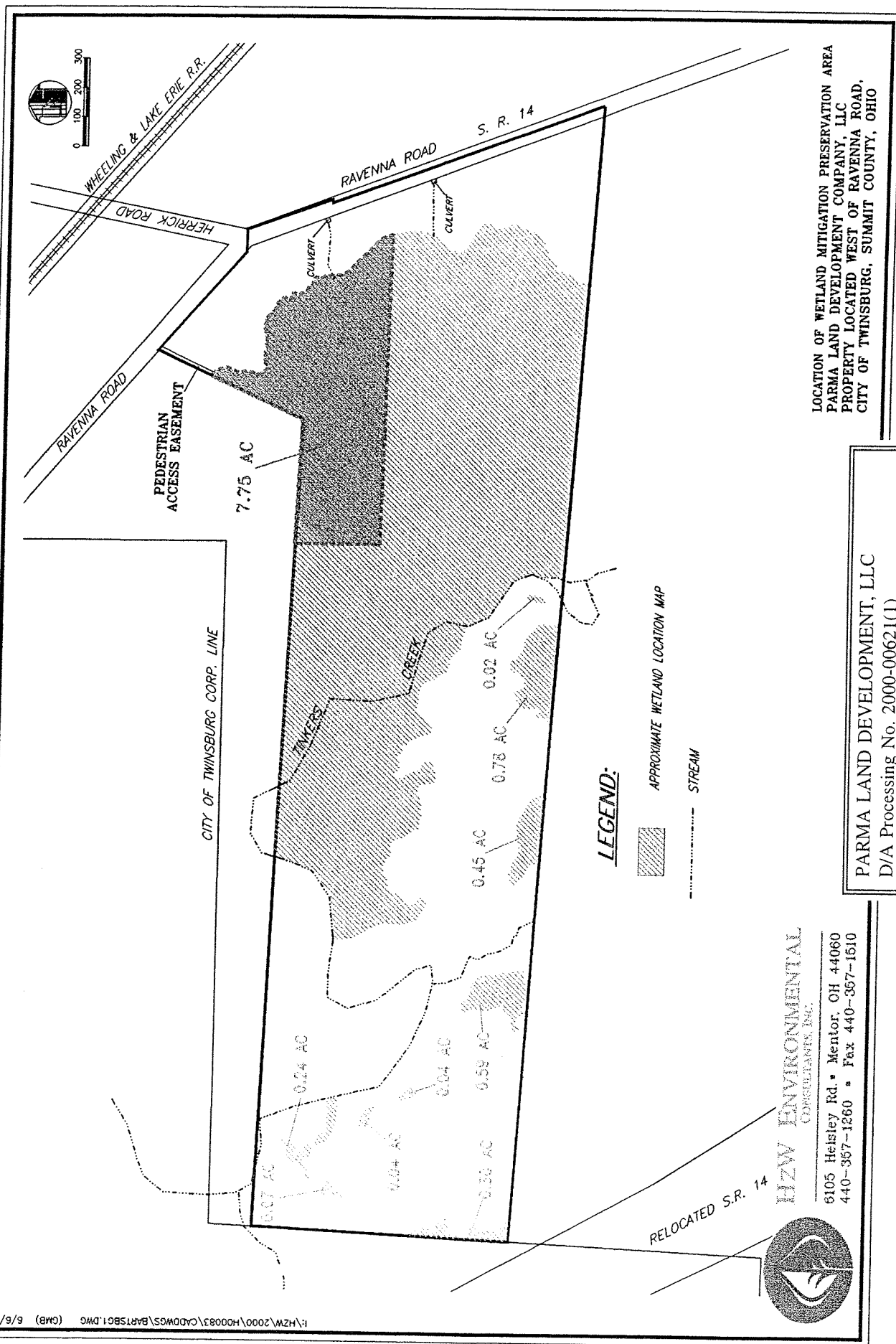


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PROPOSED MITIGATION SITE: TWINSBURG BOG

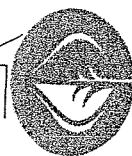
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LOCATION OF WETLAND MITIGATION PRESERVATION AREA
PARMA LAND DEVELOPMENT COMPANY, LLC
PROPERTY LOCATED WEST OF RAVENNA ROAD,
CITY OF TWINSBURG, SUMMIT COUNTY, OHIO

PARMA LAND DEVELOPMENT, LLC
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RELOCATED S.R. 14



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